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Original Research Article

Maternal outcomes in postpartum haemorrhage: a prospective observational study of 100 women at a tertiary referral centre in Kutch, Gujarat

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ABSTRACT

Background: Postpartum haemorrhage is the leading direct cause of maternal death worldwide and the commonest cause of maternal death in India. Outcomes at district-level referral centres serving rural populations are less well described than those at urban teaching hospitals. This study evaluated maternal outcomes in such a setting.

Methods: This prospective observational study included 100 women with postpartum haemorrhage at a tertiary referral centre in Bhuj, Gujarat, between April 2024 and October 2025. Demographic profile, aetiology, management and outcome were recorded. A composite severe maternal outcome was defined a priori as obstetric hysterectomy, transfusion of four or more units, or maternal death. Associations were tested using Fisher's exact test.

Results: Seventy-four women were unbooked, 68 rural and 54 referred after delivering elsewhere. Mean age was 29.2 years (SD 5.6) and mean parity 3.56 (SD 2.13). Uterine atony was the leading cause (68%), followed by genital tract trauma (19%). Surgical intervention was required in 66%, most commonly uterine packing (30%); hysterectomy in 12%. Blood products were transfused in 80%. Postpartum anaemia was the commonest morbidity (34%). Eight women died (8%). Severe maternal outcome occurred in 17% and was associated with caesarean delivery (27.9% versus 8.8%, $p=0.016$) and previous caesarean section (35.0% versus 12.5%, $p=0.040$), but not with anaemia or preeclampsia.

Conclusions: Case fatality was substantially higher than in comparable published series. Severe maternal outcome clustered around operative delivery and uterine scar rather than antenatal risk factors, suggesting that reducing the interval to definitive haemorrhage control matters more than antenatal risk stratification in this setting.

Keywords: Postpartum haemorrhage, Maternal mortality, Severe maternal outcome, Obstetric hysterectomy, Blood transfusion, Referral and consultation

INTRODUCTION

Postpartum haemorrhage remains the leading direct cause of maternal death worldwide, accounting for 27.1% of maternal deaths, of which more than two thirds occur after delivery.¹ An estimated 27 million women are affected each year and roughly 43,000 die, a death every twelve minutes.² The burden falls unevenly, and deaths from haemorrhage are concentrated in low-income and middle-income countries.³ In India, obstetric haemorrhage remains the largest single cause of maternal death,

accounting for approximately a quarter of maternal deaths, and postpartum haemorrhage is its commonest form.⁴

Reported prevalence varies with how blood loss is measured and where. An early systematic review placed global prevalence near 6% and severe haemorrhage near 1.86%, while regional analysis found severe postpartum haemorrhage lowest in Asia at 1.9% and highest in Africa at 5.1%.^{5,6} More recent pooling across more than 21 million women gives a prevalence of 9.97%, rising to 11.25% where blood loss was measured objectively rather

than estimated visually.⁷ The same analysis identifies absent antenatal care and rural residence among the determinants of adverse outcome, a description that fits much of the population served by district referral hospitals in India.⁷ Where a woman must be moved to reach definitive care, the interval between the onset of bleeding and its control is often what decides the outcome.

The aetiology is well characterised. Uterine atony accounts for close to 70% of cases, followed by genital tract trauma, retained placental tissue and coagulopathy.^{7,8} Management has been standardised around uterotonics, tranexamic acid, uterine tamponade and stepwise surgical escalation to hysterectomy.⁹ Maternal outcomes nonetheless differ markedly between settings where these measures are equally available, and the World Health Organization Multicountry Survey found that severe maternal outcomes among women with postpartum haemorrhage tracked the circumstances of care as closely as the haemorrhage itself.¹⁰ Published Indian series are drawn largely from urban teaching hospitals. Data from district-level referral centres serving dispersed rural populations, where a substantial proportion of women arrive after having delivered elsewhere, remain limited.

Kutch is the largest district in India by area, and G. K. General Hospital at Bhuj serves it as a tertiary obstetric referral centre. The present study was undertaken to evaluate maternal outcomes in women with postpartum haemorrhage managed at this centre. The objectives were to describe the demographic and obstetric profile of affected women, to determine the aetiology of haemorrhage and the medical and surgical interventions required, to document maternal morbidity and mortality, and to identify factors associated with a composite severe maternal outcome.

METHODS

Study design and setting

This prospective observational study was conducted in the Department of Obstetrics and Gynaecology at Gujarat Adani Institute of Medical Sciences and G. K. General Hospital, Bhuj, a tertiary care teaching hospital serving Kutch district in Gujarat, India. The hospital receives obstetric referrals from primary and secondary facilities across the district, and a substantial proportion of women reach it after having delivered elsewhere.

Study period

Data were collected between April 2024 and October 2025, a period of nineteen months.

Participants

Women were eligible if postpartum haemorrhage was diagnosed and documented following delivery at the study centre, or if they were referred to the study centre with

postpartum haemorrhage after delivering at another facility. Women who declined participation and those with incomplete medical records were excluded. One hundred women meeting these criteria were enrolled.

Definitions

Primary postpartum haemorrhage was defined as blood loss of 500 ml or more from the genital tract within 24 hours of birth, and secondary postpartum haemorrhage as abnormal or excessive bleeding from the birth canal between 24 hours and 12 weeks after delivery.¹¹ Grand multiparity was taken as parity of five or more. Women were classified as booked if they had received regular antenatal supervision, and as unbooked otherwise.

Sample size

Sample size was calculated as given, where Z was 1.96 for a 95% confidence level, p was an assumed postpartum haemorrhage prevalence of 6.5%, consistent with published global estimates of approximately 6%, and d was an allowable error of 5%.⁵

$$n = Z^2 p(1 - p) / d^2$$

This yielded 93.4, rounded up to a final sample of 100.

Data collection

Data were recorded on a structured case record form following written informed consent. The variables collected were maternal age, residence, booking status, socioeconomic class, place of delivery, parity, predisposing factors, type and aetiology of postpartum haemorrhage, mode of delivery, uterotonic and surgical management, blood product requirement, maternal morbidity, duration of hospital stay and maternal outcome. Aetiology was recorded as a single primary cause for each case. Socioeconomic class was recorded in two categories, lower and middle.

Outcome measures

The primary outcome was maternal outcome, recorded as recovery or death. Secondary outcomes were maternal morbidity, blood product requirement and duration of hospital stay.

A composite severe maternal outcome was defined a priori as the occurrence of any one of the following: obstetric hysterectomy, transfusion of four or more units of blood products, or maternal death. This construction follows the logic of the WHO maternal near-miss framework, which identifies severe maternal morbidity through management-based criteria rather than through measured blood loss.^{12,13} Because intensive care admission was not recorded in this study, the composite is narrower than the full near-miss definition and is not presented as an application of WHO near-miss criteria.

Statistical analysis

Categorical variables were summarised as frequencies and percentages, and continuous variables as mean with standard deviation and median with range. Associations between categorical variables were assessed using Pearson's chi-square test, with Fisher's exact test substituted for two-by-two tables in which any expected cell count fell below five. This was the case for most comparisons in the present dataset. For the association between mode of delivery and aetiology, expected counts in the full cross-tabulation were too small for a valid test, and categories were therefore collapsed to atonic versus all other causes, and vaginal versus caesarean delivery, with caesarean including vaginal birth after caesarean. A two-sided p value below 0.05 was considered statistically significant. Analyses were performed using python version 3.12.3 with the SciPy library version 1.17.1.

Multivariable logistic regression was not undertaken. With 17 severe maternal outcomes among 100 women, the number of events was insufficient to support a stable multivariable model.

Ethical considerations

The study was approved by the Institutional Ethics Committee, Gujarat Adani Institute of Medical Sciences, Bhuj (GAIMS/IEC/APPROVAL/2024/56 dated 30 March 2024, Protocol No. IEC/RESCH/2023/087), under the protocol title "Study of Maternal Outcome in Cases of Postpartum Hemorrhage". Written informed consent was obtained from all participants. Patient confidentiality was maintained throughout and the data were used solely for research purposes.

RESULTS

Baseline characteristics

One hundred women with postpartum haemorrhage were studied. Their mean age was 29.2 years (SD 5.6), with a median of 30 years and a range of 19 to 44 years, and the largest single age band was 31 to 35 years. The cohort was drawn overwhelmingly from disadvantaged groups: 74 women were unbooked, 74 belonged to the lower socioeconomic class and 68 were rural residents. No woman was classified as upper class. Fifty-four women had delivered at another facility and were referred to the study centre after haemorrhage had already begun.

Parity was high, with a mean of 3.56 (SD 2.13) and a median of 4. Thirty-four women were grand multiparous and 25 were primiparous.

A predisposing factor was identified in 58 women, most commonly anaemia in 28 and previous caesarean section in 20. The remaining baseline characteristics are shown in Table 1.

Table 1: Baseline demographic and obstetric characteristics (n=100).

Characteristics	N	%
Age group (years)		
≤20	6	6.0
21-25	24	24.0
26-30	23	23.0
31-35	37	37.0
>35	10	10.0
Residence		
Rural	68	68.0
Urban	32	32.0
Booking status		
Booked	26	26.0
Unbooked	74	74.0
Socioeconomic class		
Lower	74	74.0
Middle	26	26.0
Place of delivery		
Study centre	46	46.0
Referred in after delivery elsewhere	54	54.0
Parity		
Primipara (para 1)	25	25.0
Multipara (para 2-4)	41	41.0
Grand multipara (para ≥5)	34	34.0
Predisposing factors*		
Anaemia	28	28.0
Previous caesarean section	20	20.0
Antepartum haemorrhage	12	12.0
Preeclampsia	10	10.0
Multiple pregnancy	8	8.0
Polyhydramnios	7	7.0

Mean age 29.2 years (SD 5.6), median 30, range 19-44. Mean parity 3.56 (SD 2.13), median 4, range 1-9. *Not mutually exclusive. A predisposing factor was present in 58 women; 36 had one, 17 had two and five had three

Aetiology and mode of delivery

Uterine atony was the leading cause, accounting for 68 cases, followed by genital tract trauma in 19 and retained placenta in 10. Coagulopathy and uterine inversion together accounted for the remaining three. Ninety-two women had primary and eight had secondary postpartum haemorrhage. Fifty-seven women delivered vaginally, 40 by lower segment caesarean section and three by vaginal birth after caesarean (Table 2). Atonic haemorrhage was proportionally more frequent after caesarean delivery than after vaginal delivery, occurring in 35 of 43 women delivered by caesarean section or vaginal birth after caesarean, compared with 33 of 57 delivered vaginally (Fisher's exact test, p=0.017).

Management

All 100 women received uterotonic therapy. Sixty-two required the four-drug combination of oxytocin,

misoprostol, carboprost and methylergometrine, while 38 were controlled with oxytocin and misoprostol alone.

Table 2: Type and aetiology of postpartum haemorrhage and mode of delivery (n=100).

Variables	N	%
Type of PPH		
Primary	92	92.0
Secondary	8	8.0
Aetiology		
Uterine atony	68	68.0
Genital tract trauma	19	19.0
Retained placenta	10	10.0
Coagulopathy	2	2.0
Uterine inversion	1	1.0
Mode of delivery		
Vaginal delivery	57	57.0
Lower segment caesarean section	40	40.0
Vaginal birth after caesarean	3	3.0

Aetiology was recorded as a single primary cause per case; categories are mutually exclusive

Surgical or procedural intervention was required in 66 women, of whom 26 underwent one procedure and 40 underwent two or more. Uterine packing was the commonest intervention, performed in 30 women, followed by cervical or vaginal tear repair in 21, uterine artery ligation in 19 and manual removal of placenta in 19. Compression sutures were applied in 16 women. Obstetric hysterectomy was performed in 12 (Table 3).

Blood products were transfused in 80 women, with a mean requirement of 1.72 units (SD 1.21). Forty-four women received two units and seven received four or more.

Maternal morbidity and outcome

Fifty-seven women developed at least one complication. Postpartum anaemia was commonest, affecting 34, followed by pyrexia in 25 and wound infection in 16. Disseminated intravascular coagulation occurred in seven women, sepsis in four and renal failure in two. Twenty-one women had two or more concurrent complications.

The mean duration of hospital stay was 4.44 days (SD 1.19). Ninety-two women recovered and eight died, giving a case fatality of 8% (Table 4).

Mortality rose sharply with transfusion requirement. Three of the 81 women receiving two units or fewer died, compared with five of the 19 receiving more than two units (Fisher's exact test, $p=0.006$). Of the 12 women who underwent obstetric hysterectomy, six died and six survived.

The primary cause of death was haemorrhagic or hypovolaemic shock in six women and refractory haemorrhage complicated by disseminated intravascular

coagulation in two. No death was attributed to a non-haemorrhagic cause.

Death occurred at a median of three days from admission, with a range of one to seven days.

Table 3: Management of postpartum haemorrhage (n=100).

Interventions	N	%
Uterotonic regimen		
Oxytocin and misoprostol	38	38.0
Oxytocin, misoprostol, carboprost and methylergometrine	62	62.0
Surgical and procedural intervention*		
Uterine packing	30	30.0
Cervical or vaginal tear repair	21	21.0
Uterine artery ligation	19	19.0
Manual removal of placenta	19	19.0
Compression sutures	16	16.0
Obstetric hysterectomy	12	12.0
Suction evacuation	10	10.0
Repositioning of uterus	1	1.0
Blood products transfused		
None	20	20.0
1 unit	17	17.0
2 units	44	44.0
3 units	12	12.0
4 units	4	4.0
5 units	3	3.0

Mean transfusion requirement 1.72 units (SD 1.21); 80 women required transfusion. *Not mutually exclusive. Intervention was required in 66 women; 26 underwent one procedure and 40 underwent two or more

Table 4: Maternal morbidity, hospital stay and outcome (n=100).

Variables	N	%
Maternal morbidity*		
Postpartum anaemia	34	34.0
Pyrexia	25	25.0
Wound infection	16	16.0
Disseminated intravascular coagulation	7	7.0
Sepsis	4	4.0
Renal failure	2	2.0
Maternal outcome		
Recovered	92	92.0
Maternal death	8	8.0
Outcome by transfusion requirement†		
≤2 units, recovered	78	
≤2 units, died	3	
>2 units, recovered	14	
>2 units, died	5	

Mean hospital stay 4.44 days (SD 1.19), median 5, range 1-9. *Not mutually exclusive. At least one complication occurred in 57 women; 36 had one, 13 had two, six had three and two had four. †Fisher's exact test, $p=0.006$

Severe maternal outcome

Seventeen women met the composite definition of severe maternal outcome. Twelve underwent obstetric hysterectomy, seven received four or more units of blood products and eight died, with overlap between these groups.

Two factors were associated with severe maternal outcome. Severe outcome occurred in 12 of 43 women delivered by caesarean section or vaginal birth after caesarean, compared with five of 57 delivered vaginally

(27.9% versus 8.8%, $p=0.016$), and in seven of 20 women with a previous caesarean section, compared with 10 of 80 without (35.0% versus 12.5%, $p=0.040$).

Neither anaemia nor preeclampsia was associated with severe maternal outcome (21.4% versus 15.3%, $p=0.555$, and 10.0% versus 17.8%, $p=1.000$, respectively). Booking status, residence, socioeconomic class, grand multiparity, antepartum haemorrhage, referral status and type of postpartum haemorrhage were likewise not associated with severe outcome (Table 5).

Table 5: Factors associated with severe maternal outcome (n=100).

Factors	Category	Severe outcome, n/N	%	P value*
Mode of delivery	Caesarean section or VBAC	12/43	27.9	0.016
	Vaginal delivery	5/57	8.8	
Previous caesarean section	Yes	7/20	35.0	0.040
	No	10/80	12.5	
Place of delivery	Referred in	12/54	22.2	0.183
	Study centre	5/46	10.9	
Antepartum haemorrhage	Yes	0/12	0.0	0.211
	No	17/88	19.3	
Grand multiparity	Para ≥ 5	4/34	11.8	0.406
	Para 1-4	13/66	19.7	
Socioeconomic class	Lower	14/74	18.9	0.548
	Middle	3/26	11.5	
Anaemia	Yes	6/28	21.4	0.555
	No	11/72	15.3	
Type of PPH	Secondary	2/8	25.0	0.621
	Primary	15/92	16.3	
Booking status	Unbooked	12/74	16.2	0.765
	Booked	5/26	19.2	
Preeclampsia	Yes	1/10	10.0	1.000
	No	16/90	17.8	
Residence	Rural	12/68	17.6	1.000
	Urban	5/32	15.6	

Severe maternal outcome was defined as obstetric hysterectomy, transfusion of four or more units, or maternal death, and occurred in 17 women. Components: obstetric hysterectomy 12, four or more units 7, maternal death 8, with overlap. *Fisher's exact test

DISCUSSION

Among 100 women managed for postpartum haemorrhage at this centre, three quarters were unbooked and from lower socioeconomic backgrounds, two thirds were rural residents, and more than half arrived after delivering at another facility. Uterine atony was the dominant aetiology.

Management was intervention-heavy: every woman received uterotonic therapy, two thirds required a surgical or procedural intervention, 30% underwent uterine packing, 12% underwent obstetric hysterectomy, and 80% received blood products. Eight women died. A composite severe maternal outcome occurred in 17%, and was associated with caesarean delivery and with previous caesarean section, but not with anaemia, preeclampsia, booking status, residence or parity.

Cohort profile and referral burden

The demographic profile of this cohort is not incidental to its outcomes. In a study of severe maternal outcomes across two tertiary hospitals in Belagavi, 69.5% of women were unbooked and 80% presented as referrals, and delay in reaching an appropriate facility affected 65% while delay in receiving adequate care once there affected every referred woman.¹⁴ Referrals in that series were driven by absent blood products and absent instruments or medicines at the originating facility.¹⁴ A review of maternal deaths at a tertiary centre in Chhattisgarh reported a maternal mortality ratio of 802 and identified the first delay in 95.54% of deaths, attributing the excess to suboptimal antenatal care, long travel distances, high referral volume and admission at an already complicated stage.¹⁵ The present cohort, at 74% unbooked and 54% referred in, sits within that pattern. The WHO Multicountry Survey

similarly found that severe maternal outcomes among women with postpartum haemorrhage tracked the circumstances of care rather than the haemorrhage alone.¹⁰ A mean parity of 3.56 with 34% grand multiparity further reflects a population with limited access to contraceptive services.

Aetiology

Uterine atony accounted for 68% of cases, closely matching the 69% reported from a tertiary centre in Maharashtra and sitting close to the pooled figure of nearly 70% reported in a recent umbrella review.^{7,16} A hospital record based series from Tamil Nadu reported a higher atonic share at 79.11%.¹⁷ Genital tract trauma at 19% aligns closely with the 20% and 19.56% reported in those two series respectively.^{16,17} Atonic haemorrhage was proportionally more frequent following caesarean delivery than vaginal delivery in this cohort, a difference that reached significance and is consistent with the recognised association between operative delivery and impaired myometrial contraction.

Management intensity

Two thirds of women required surgical or procedural intervention. This is strikingly higher than the 8.88% reported from Tamil Nadu, where 91.11% of cases were controlled by medical management alone.¹⁷ Uterine packing, used in 30%, was the commonest single intervention. Published pooled success rates for uterine balloon tamponade approach 85.9% overall and 87.1% specifically in uterine atony, with Indian device-specific reviews reporting 92.3% effectiveness for condom balloon tamponade in atonic haemorrhage.^{18,19} That escalation beyond tamponade was nonetheless required in a substantial proportion here suggests women were presenting at a later stage of blood loss than these figures assume.

Obstetric hysterectomy was performed in 12%. Direct comparison requires care, since a series reporting peripartum hysterectomy at 1.3 per 1,000 uses all deliveries as the denominator, whereas the denominator here is women with established postpartum haemorrhage.²⁰ Against a comparable denominator the figure is less exceptional: hysterectomy was performed in 12.06% of atonic cases in the Maharashtra series.¹⁶ Blood products were required by 80%, close to the 82.14% reported from Maharashtra^[16] and well above the 50% reported in a recent series of singleton pregnancies.²¹

Maternal mortality

Case fatality of 8% is the principal finding of this study and is roughly double the highest figure among comparable published series. Recent Indian series report maternal mortality among women with postpartum haemorrhage of 3.4% among 60 women, 1.78% among 225 women, and none at all in a labour-room series

confined to spontaneous vaginal deliveries.^{17,21,22} These comparator series are small and their mortality estimates correspondingly imprecise, but all three lie well below the present figure. The requirement for more than two units of blood products was strongly associated with death in the present cohort, which is consistent with transfusion volume serving as a proxy for the magnitude of blood loss.

Of the twelve women who underwent obstetric hysterectomy, six died. This is far above the 4% case fatality per hysterectomy reported from an Indian tertiary centre.²⁰ The interpretation is not that hysterectomy contributed to these deaths. Hysterectomy is undertaken when conservative measures have failed, and it therefore identifies the most severely affected women rather than causing their deterioration. The more probable explanation is that in this referral-dependent setting, women reaching the point of requiring hysterectomy had already sustained prolonged blood loss before definitive surgical control was achieved.

The distribution of causes supports this reading. Six of the eight deaths were attributed to haemorrhagic or hypovolaemic shock and the remaining two to refractory haemorrhage complicated by disseminated intravascular coagulation, both of which also involved renal failure. No death was attributed to a non-haemorrhagic cause. Five of the eight women had been referred in after delivering elsewhere and six had undergone obstetric hysterectomy. Death occurred at a median of three days from admission, indicating that most followed an early and irreversible haemorrhagic collapse rather than a protracted complicated course. This is the pattern expected where definitive haemorrhage control is achieved late rather than where it fails outright. The predominance of shock is consistent with a larger Indian series in which three quarters of deaths among women with postpartum haemorrhage were attributed to shock.¹⁷

Factors associated with severe maternal outcome

Two factors reached significance. Severe maternal outcome occurred in 27.9% of women delivered by caesarean section or vaginal birth after caesarean, against 8.8% delivered vaginally, and in 35.0% of women with a previous caesarean section against 12.5% of those without. Both are consistent with published evidence. Peripartum hysterectomy has been reported as substantially more common following caesarean delivery, with an odds ratio of 22.86 in one Indian series in which 27 of 30 women with morbidly adherent placenta had undergone a previous caesarean.²⁰

Anaemia was not associated with severe maternal outcome in this cohort. This appears to contradict its established status as a risk factor, but the published evidence is more specific than is often stated. A meta-analysis of thirteen studies found that severe prenatal anaemia raised the risk of postpartum haemorrhage with an odds ratio of 3.54, while mild anaemia showed no association and moderate

anaemia showed no statistically significant association.²³ Anaemia was recorded here as a binary variable without haemoglobin values or severity grading, and the majority of anaemic women in a general obstetric population fall into the mild and moderate categories. The variable available to us therefore could not isolate the group in which the association resides. A cohort analysis from the WOMAN-2 trial reports a monotonic relationship between falling haemoglobin and haemorrhage risk with a sevenfold increase in severe anaemia, and the present null result should be read as a limitation of measurement rather than as evidence against that relationship.²⁴

Grand multiparity was likewise not associated with severe maternal outcome. Published findings on this question are genuinely divided. One prospective cohort reported an adjusted risk ratio of 2.1 for postpartum haemorrhage in grand multiparous women, while a large retrospective series found an association on univariate analysis that did not survive multivariable adjustment, leading its authors to argue against protocols mandating routine additional intervention in these women.^{25,26} A more recent multicentre cohort concluded that among grand multiparous women the operative risk factor was an adverse outcome in a prior pregnancy rather than increasing parity itself.²⁷

Strengths and limitations

The principal strength of this study is that it describes a district-level referral population that is under-represented in the published Indian literature, and that all analyses derive from a single prospectively maintained dataset.

Several limitations apply. This is a single-centre study of modest size and its findings may not generalise. Estimated blood loss was not recorded, so a conventional severity classification was not possible and a composite outcome was used in its place. Intensive care admission was not recorded, so that composite is narrower than the full WHO near-miss criteria, although local adaptation of those criteria is established practice where laboratory and management-based markers are unavailable.²⁸ Haemoglobin values, gestational age at delivery and tranexamic acid use were not recorded; the last is a material omission given the demonstrated mortality benefit of early tranexamic acid administration in postpartum haemorrhage.²⁹ Socioeconomic status was recorded in two categories without a named standardised scale. Finally, with 17 severe maternal outcomes the study was underpowered for multivariable logistic regression, and the associations reported are unadjusted.

CONCLUSION

Postpartum haemorrhage at this tertiary referral centre occurred in a population that was predominantly unbooked, rural and of high parity, with more than half of affected women arriving after delivery elsewhere. Uterine atony remained the leading cause, management was

substantially more interventional than in comparable published series, and case fatality reached 8%.

Severe maternal outcome clustered around caesarean delivery and previous caesarean section rather than around the antenatal risk factors conventionally emphasised. This points less towards better antenatal risk stratification and more towards shortening the interval between the onset of bleeding and definitive control: strengthening peripheral capacity for early tamponade and transfusion, and reducing the delay before referral. Recording estimated blood loss, haemoglobin values and intensive care admission would allow future work at this centre to apply standard severity criteria and to quantify that interval directly.

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