Consequences of severe obstetric complications on women’s health in Morocco: please, listen to me!

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Abstract

Objective In Morocco, medical care for women with severe obstetric complications (near-miss cases) ends at discharge from the hospital. Little information exists regarding what happens after returning home. The aim of the study was to assess the physical and mental health consequences of near-miss events on Moroccan women 8 months after childbirth.

Methods A prospective cohort study of 76 near-miss women was conducted in three hospitals. For every case, we recruited at least two women from the same hospital who had uncomplicated deliveries (n = 169). We used a mixed-methods approach. For the quantitative part, we analysed sociodemographic characteristics collected via a questionnaire and medical complications extracted from the medical records during a medical consultation at 8 months post-partum. Forty in-depth interviews were also conducted with 20 near-miss cases and 20 women with uncomplicated deliveries.

Results The near-miss women were poorer and less educated than those who had uncomplicated deliveries. The proportion of physical consequences (serious illness) was higher among near-miss cases (22%) than uncomplicated deliveries (6%, P = 0.001). The risk of depression was significantly higher among near-miss cases with perinatal death (OR = 7.16; [95% CI: 2.85–17.98]) than among those who had an uncomplicated delivery. Interviews revealed that the economic burden of near-miss care contributed to social problems among the women and their households.

Conclusion A near-miss event has consequences that go beyond the first days after delivery. Developing new mechanisms for maternal and newborn health follow-up is essential and should address the mother’s physical and mental health problems and involve husbands and family members.

Keywords maternal near-miss case, physical consequences, mental consequences, Morocco

Introduction

In safe motherhood programmes in low- and middle-income countries (LMICs), insufficient consideration has been given to maternal morbidity and its obstetric consequences after childbirth [1]. The true burden of maternal morbidity is still unclear, as the existing estimates and calculations are not standardised and do not use transparent methods [2, 3]. It is estimated that 10–20 million women may suffer from mental and physical disabilities as a result of complications of childbirth [4]. A great number of women who experienced complications during childbirth are discharged from hospital before they have fully recovered [5, 6]. Most problems related to long-term post-partum complications do not lead to death, but they are significantly disabling and have social and economic impacts on families, communities and society [7–9]. An analysis of the overall costs of maternal disability has estimated annual costs of US $ 6.8 billion [10].

Several studies have demonstrated that the magnitude of the consequences of severe obstetric maternal morbidity, also called ‘near-miss cases’, remains insufficiently investigated [1, 5]. A near-miss case is defined by WHO [11] as ‘the near-death of a woman who has survived a complication during pregnancy or childbirth or within 42 days of the termination of pregnancy, thanks to the services provided’. Near-miss cases can have dramatic economic consequences for the whole family, costing more than 34% of the annual household expenditure [12]; such events can be traumatic, especially when they hit the poorest populations [4].
In Morocco, only 22% of women attend post-partum consultations [13]. The only existing study on the extent of maternal morbidity in the country showed that 60% of women have at least one health problem related to childbirth at 6 weeks post-partum [14]. The consequences of obstetric near-miss cases have never been investigated. The care for near-miss women ends when they are discharged from the hospital. There is a significant lack of understanding of the magnitude of the physical or mental health problems that could eventually affect these women during the post-partum period. Monitoring the evolution of near-miss cases will help find solutions to prevent these consequences and will improve the care that mothers and newborns receive. Such monitoring would also increase clinicians’ awareness of the post-partum period. The aim of our study is to understand how a near-miss episode can affect the post-partum physical and mental health of women in Morocco.

Methods
We conducted a prospective cohort study comparing women with severe obstetric maternal morbidity ‘near-miss cases’ and women with uncomplicated deliveries. We used a mixed-methods approach.

Population and study setting
We recruited all near-miss cases identified between February 1 and July 31, 2012, at three referral public hospitals (Mohammed VI district Hospital in Al Haouz and the University Hospital and Ibn Zohr Regional Hospital in Marrakech) with respectively 1388, 14972 and 4860 deliveries in 2012 [15] in two districts of Marrakech region (Marrakech City and Al Haouz). Marrakech is predominantly urban, while Al Haouz is rural and mountainous and has difficult access to care. We applied the definition used by Sahel et al. [16] for screening near-miss cases; they were defined as women who experienced a severe acute maternal morbidity (Appendix). We combined different criteria, related to (i) a specific disease entity (e.g. pre-eclampsia, post-partum haemorrhage), (ii) management (e.g. admission to ICU, the need for a blood transfusion) and (iii) organ system dysfunction [17–19]. For every near-miss case, we recruited at the same hospitals and during the same period at least two women with uncomplicated deliveries (unexposed group) who delivered after the near-miss case. Those women were matched with the near-miss cases by place of residence.

For the in-depth interviews, a subsample of 20 near-miss cases and 20 women in the unexposed group was randomly selected from a pre-defined quota sample on the basis of perinatal status immediately post-partum. Among the near-miss cases, seven had a perinatal death and 13 had a live birth. For the unexposed group subsample, we selected three women whose infants died during childbirth and 17 women who had live births.

Study tools
During the consultation 8 months after the delivery, we administered a tested and validated medical questionnaire to all of the women in the cohort. This questionnaire allowed doctors to assess both the physical and the mental health of the women. To measure the related mental health problems, we used the Edinburgh post-partum depression scale (PDS) [20]. The items of the scale were reviewed and adapted to the Moroccan context and were tested in two health facilities before they were used.

The in-depth interviews followed an interview guide and were conducted with the women and their families to collect information about the social and economic impacts of pregnancy on the lives of the women and their families and about the effects of near-miss event in terms of marital relationships, stigma and social exclusion.

Procedures
After obtaining the women’s consent after delivery, trained midwives informed them that they would be contacted for a consultation after 8 months. The midwives also emphasised the importance of going to the nearest health centre in case of any health problem and/or after one week and six weeks, in accordance with the national surveillance programme for pregnant and post-partum women.

The identification of the women and the monitoring of the procedures were ensured by a team of four investigators: two gynaecologists, one intensive care physician and a public healthcare specialist (the principal investigator). The 8 months post-partum medical assessment took place only at the two non-university hospitals between November 2012 and April 2013. Trained midwives extracted data from medical records and from the post-partum medical assessment reports. Four near-miss cases did not attend the 8-month consultation: one was lost to follow-up, and three refused to attend because of problems with healthcare providers in the health facilities where they delivered. Nineteen in the unexposed group did not
attend: seven were lost to follow-up, seven had a perina-
tal death or refused to attend a medical consultation, and
five said they felt good and did not need a medical con-
sultation.

Women diagnosed with any physical health problems
were managed by a gynaecologist, while women with sus-
ppected mental health problems identified through the
Edinburgh PDS were informed of their status and were
referred to a psychiatrist. The patients’ travel costs and
appointments with psychiatrists were supported by the
framework of the study.

Regarding the qualitative aspect of the study, the in-
depth interviews were conducted by two trained inter-
viewers, using a topic guide. The interviews were open-
ended and explored women’s experiences during the
8 months post-partum period, asking about childbirth,
healthcare seeking, economic aspects of care-seeking, per-
ceived health, social relationships, and the social and eco-
nomic impact of childbirth on their families. Most of the
interviews took place at the women’s homes; whenever
possible, we also interviewed their husbands or other rel-
atives. The interviews were conducted either in Arabic or
in a local language (Berber). All interviews were recorded
and transcribed verbatim with translation to French.

Because of limited financial resources and the difficulty of
access to certain areas; we interviewed 15 women at the
nearest health facility or at an accessible place of the
woman’s choice while respecting her privacy and confi-
dentiality.

The study protocol was approved by the Ethics Com-
nittees of the Institute of Tropical Medicine Antwerp
(Belgium), the University of Antwerp (Belgium) and the
Mohammed V Souissi University of Rabat (Morocco).

Data analysis

Data were entered and managed using Epi Info 2007
(CDC Atlanta). Data analysis was performed using the
IBM SPSS Version 20 statistical software. We used Fish-
er’s exact test to calculate the significance levels of per-
centages and averages, comparing the near-miss cases
with or without perinatal death with women who had an
uncomplicated delivery with or without perinatal death.
The relationship between poor health status during the
8 months after childbirth and the Edinburgh PDS score
(<10 or ≥10) was assessed using logistic regression with
adjustment for possible confounding factors, such as ser-
ious illness, economic level, education level, perinatal
death and parity.

The analysis of the in-depth interviews focused on
exploring factors related to the women’s social relation-
ships, life experiences and socio-economic problems dur-
ing the eight months post-partum and any associated
psychological distress.

Results

Of 245 women selected (76 near-miss cases and 169
women with uncomplicated deliveries), 222 (91%) had a
medical assessment at 8 months. The 23 (9%) who were
lost to follow-up were young women in the 18–25 age
group (65%), most often with perinatal deaths (57%),
who were not covered by health insurance (70%) and
who belonged to the poorest quintile (78%).

Hypertensive disorder was the most common cause of
near-miss events (47.4%), followed by haemorrhage
(40.8%), infection (14.4%) and dystocia (6.5%)
(Table 1). The mean age of the participating women was
28 years (range 18–45); their mean parity was 2.76
(range 1–6). Among the near-miss cases, there were 21
stillbirths, three newborns who died in the first week, 1
who died after 4 weeks and one who died after 6 weeks.
To facilitate the analysis, we included the two newborn
deaths at 4 and 6 weeks among the perinatal deaths. There
were no significant differences between the four
categories of women (near-miss cases with live births,
near-miss cases with perinatal deaths, unexposed with
live births, and unexposed with perinatal deaths) in terms
of age (P = 0.29) and parity (P = 0.81). The women who
had a normal birth were significantly richer and better
educated than the near-miss women, especially those who
died (Table 1). No woman in any category died during
the eight months post-partum follow-up period.

Consequences of near-miss on women’s physical health

In the cohort, 69% (169/245) of the women sponta-
eously reported at least one problem during the medical
assessment, of whom 55% had health problems diag-
nosed by a doctor (Table 2). The remaining 14% of
women reported emotional problems and severe fatigue.
Table 3 highlights the consequences of a near-miss event
for a woman’s health at 8 months post-partum. The pro-
portion of physical effects (serious illness) was high for
the near-miss (22%) compared to the uncomplicated
deliveries (6%; P = 0.001) (Table 3). The same results
were observed for the other complications; near-miss
cases were more likely to be hypertensive (6%) than
women who had an uncomplicated delivery (0.6%;
P = 0.001), to suffer from urinary incontinence (4% vs.
1.3%; P = 0.001), or to have a genital prolapse (18% vs.
2.5%; P = 0.001). We found no significant difference
in the rate of genital infections (18% vs. 12.6%;
P = 0.05).
Consequences of near-miss on women’s mental health

Edinburgh PDS scores higher than 10 are considered worrisome. A score ≥13 is classified as a case of major depression. The near-miss cases suffered more from depression (38%) than did the women who had an uncomplicated delivery (10.7%, $P = 0.0001$) (Table 3). Furthermore, we found that a greater proportion of near-miss cases with perinatal deaths had a sense of being perceived negatively (38.5%) than women who experienced uncomplicated deliveries and perinatal deaths (18%, $P = 0.03$).
Factors determining the psychological status of women

The first column of Table 4 was used to quantify the risk factors based on a high Edinburgh PDS score (≥10) at 8 months post-partum. The risk of having a score over 10 was significantly higher (OR = 7.16 [95% CI 2.85–17.98]) among near-miss cases with a perinatal death than those who had an uncomplicated deliveries. This risk was also higher among near-miss cases with a live baby (OR = 5.12 [95% CI 2.39–10.96]) and for women with an uncomplicated delivery and perinatal death (OR = 5.57 [95% CI 1.43–21.73]) after adjusting and controlling for potentially confounding effects of psychological distress at eight months post-partum (e.g. having had physical problems, being in the poorest quintile and having a low level of education).

In the final model of the logistic regression model (Table 4), we found that being a near-miss case with a perinatal death increases the risk of having a PDS Edinburgh ≥10; indeed, a near-miss case with a perinatal death had a 5 times higher risk OR = 4.7 [95% CI 1.79–12.54] of developing psychological distress (EPDS ≥10); and near-miss cases with a live birth also had higher risk (OR = 4.08 [95% CI 1.85–8.99]) of psychological distress than women who had an uncomplicated delivery. Women with an uncomplicated delivery and perinatal death were also at higher risk (OR = 3.96 [95% CI 0.95–16.41]) of developing psychological distress than women who had an uncomplicated delivery. This risk was lower and not significant compared with near-miss case’s risk. This result showed that perinatal mortality...
did not have a significant effect on psychological distress at post-partum (8 months). Indeed, being a near-miss case increased the probability of developing psychological distress at the post-partum period (8 months) (Table 4).

We noticed that we have small samples and we must be careful with interpretation of results.

Women’s stories

The near-miss cases expressed their gratitude to God and to the health staff for saving their lives. They reported the cumulative effect of the events around the childbirth and the difficulty of follow-up because of their distance from health facilities and lack of money. Even their family criticised this situation.

‘...I had treated the wound until it healed; the hospital is far away. I took her to the hospital just to remove the sutures. My daughter-in-law [did not receive any information about the care she received or about what she should do after discharge]. She is tired all the time, and she does nothing at home... She often sleeps, she is tired all the time, and I am the one who is taking care of my grandson...' (Mother-in-law, Al Haouz).

Sometimes, the women’s conditions can be understood as resulting from their physical conditions, but in fact their emotional health was also affected. Moreover, the women’s lack of confidence and their weakness had an impact on their ability to perform their household duties. In addition, the relationships with their husbands were affected along with their plans for future pregnancies.

Some women have reported that their birth experiences had a financial impact on their life because of the debts resulting from their delivery, their inability to pay, and their strained relationships with their family, especially mother-in-laws. For some women, post-partum expenses led to marital stress, characterised by disputes and sometimes physical violence. ‘...The cost of the delivery was 200 Dirhams ($21) (for medicines), which is more than we can afford with our (budget). I have marital problems. I am in the process of getting divorced because of my husband’s infidelity, and this is because of my problem after childbirth... I breastfed my child for 6 months, he is doing well...’ (near-miss case; live birth, Marrakech).

Table 4 Effects of risk factors on the Edinburgh score with logistic regression at 8 months after delivery

<table>
<thead>
<tr>
<th>Exposure</th>
<th>Crude OR [95% CI]</th>
<th>P-value</th>
<th>Final model OR [95% CI]</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Delivery status</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Uncomplicated delivery</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Uncomplicated delivery &amp; perinatal death</td>
<td>5.57 (1.43–21.73)</td>
<td>0.013</td>
<td>3.96 (0.95–16.41)</td>
<td>0.058</td>
</tr>
<tr>
<td>Near-miss &amp; live baby</td>
<td>5.12 (2.39–10.96)</td>
<td>&lt;0.001</td>
<td>4.08 (1.85–8.99)</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Near-miss &amp; perinatal death</td>
<td>7.16 (2.85–17.98)</td>
<td>&lt;0.001</td>
<td>4.7 (1.79–12.54)</td>
<td>0.002</td>
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<tr>
<td>Physical complications</td>
<td></td>
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<tr>
<td>Serious illness</td>
<td>4.76 (2.48–9.12)</td>
<td>&lt;0.001</td>
<td>3.15 (1.56–6.36)</td>
<td>0.001</td>
</tr>
<tr>
<td>Hypertension</td>
<td>0.61 (0.71–5.19)</td>
<td>0.652</td>
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<tr>
<td>Genital infection</td>
<td>1.29 (0.59–2.86)</td>
<td>0.524</td>
<td></td>
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<tr>
<td>Haemorrhoids</td>
<td>1.27 (0.48–3.38)</td>
<td>0.634</td>
<td></td>
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<tr>
<td>Anaemia</td>
<td>3.05 (0.94–9.92)</td>
<td>0.064</td>
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<tr>
<td>Dyspareunia</td>
<td>1.87 (0.17–21.05)</td>
<td>0.611</td>
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<tr>
<td>Socio-demographics factors</td>
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<tr>
<td>Education level</td>
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<tr>
<td>Educated</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Not educated</td>
<td>1.90 (1.02–3.52)</td>
<td>0.042</td>
<td></td>
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<tr>
<td>Medical insurance</td>
<td></td>
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<tr>
<td>Yes</td>
<td>1</td>
<td></td>
<td></td>
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<tr>
<td>No</td>
<td>1.25 (0.65–2.42)</td>
<td>0.503</td>
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<tr>
<td>Age</td>
<td></td>
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<tr>
<td>≤ 29 years</td>
<td>1</td>
<td></td>
<td></td>
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<tr>
<td>&gt;29 years</td>
<td>1.01 (0.55–1.88)</td>
<td>0.965</td>
<td></td>
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<tr>
<td>Socio-economic level (quintile)</td>
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<td></td>
<td></td>
<td></td>
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<tr>
<td>Richest</td>
<td>1</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Poorest</td>
<td>3.14 (1.15–8.58)</td>
<td>0.026</td>
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<tr>
<td>Parity</td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>1</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>≥2</td>
<td>1.77 (0.95–3.29)</td>
<td>0.071</td>
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</tr>
</tbody>
</table>

Statistically significant values are bolded.
For these women, it was not only the perinatal death that caused tensions, financial difficulties that their husbands and families had to pay for prescriptions and for the post-partum follow-up led to friction, irritation and tension among the family members.

The analysis of the interviews of women with perinatal death and low Edinburgh PDS scores showed that they were either young women early in their reproductive life or women from urban areas and that they were well treated during their post-partum recovery. They expressed positive feelings about their next pregnancy and their trust in God. They also reported that they had the support of their spouses and their families.

Discussion

Our study revealed that women with severe obstetric complications were generally poorer and less educated than women with uncomplicated deliveries. We found that no women died during the 8 months post-partum follow-up. However, five (7%) women who had a near-miss episode lost their babies during the second month post-partum, while no children died in the unexposed group. In some studies, the risk of death among children born to near-miss cases can be explained by the obstetric complications and their sequelae [5, 21, 22].

Near-miss cases were associated with physical complications and psychological distress at 8 months post-partum. The proportion of physical problems was significantly higher (56%) among near-miss cases than women who had an uncomplicated delivery (40%). The levels of psychological distress were much higher among women who lost their babies. At 8 months post-partum, the rate of serious illness was significantly higher among near-miss cases (22%) than among women with uncomplicated deliveries (6%; P = 0.001). This difference could be caused by some residual problems, such as the woman’s psychological status and the accumulation of social problems. We found that near-miss cases had a late consultation or no consultation at all, so they were not able to recover quickly Ross et al. [23]. Indeed, a mental health condition that persists up to 8 months post-partum could be related to consultation delay on the part of the woman, and her physical complications could be a consequence, rather than a cause, of psychological distress. In our study, the women reported more complaints than were diagnosed by a doctor (69% vs. 55%); this result is in accordance with what is described in the literature [24]. Women’s complaints should not be ignored, and qualified staff should respond to their healthcare needs [14, 25].

We found that the poor health status of a near-miss case at 8 months post-partum is not only a consequence of the obstetric complications but also a result of the woman’s financial situation and family or marital conflicts. For example, studies conducted in low- and middle-income countries (LMICs) have found that when a woman develops severe obstetric complications during childbirth, the delivery costs can have a catastrophic impact on the household’s budget for up to 1 year after delivery [12]. This economic stress is associated with both new episodes of depression and the persistence of existing episodes [7, 26, 27]. The risk factors include complicated delivery, low socio-economic status, psychological disorders during pregnancy and a history of psychological disorders [5, 28, 29]. In our study, perinatal death, economic debts, difficulties to regain the strength to perform daily household activities and tension with in-laws seem to influence the psychological status of women during the post-partum period. Other studies have come to the same conclusions [9, 30].

The interviews indicated that the majority of women who had a high score on the Edinburgh PDS lived in impoverished social and financial situations and experienced personal distress at the time of delivery. Furthermore, conflicts with their in-laws contributed to their psychological distress. Thus, perinatal death results in a series of complex interactions among several factors, including the family’s disappointment about the pregnancy that may be associated with a lack of spousal support and the uncertainty about fertility [9, 31, 32]. It has been demonstrated that severe obstetric complications, especially those that result in the loss of the baby, have negative social consequences for women. In the sociocultural context of Morocco, the identity and value of women are defined directly by their fertility and by the prestige, honour, and ‘presence’ provided by progeny, especially males [33]. In Morocco, having children is not just a personal experience that almost every woman wants; it is also a family and social obligation. Having children is the most effective way for woman to gain social status and recognition within her husband’s family, and it is an essential event for ensuring the continuity of married life [33]. Women whose near-miss cases with a live baby are not necessarily in a less precarious situation than those who had perinatal loss. Indeed, the birth of a live baby helps to protect a woman and reduces her social vulnerability, by giving her husband hope and by adding a positive element to the family. Similarly, women who died without outward signs of psychological distress have not necessarily had less traumatic experiences, but they have certainly benefited from the emotional, social and financial support of their close family members (parents, siblings) or were younger and therefore had more hope for getting another pregnancy.
A first limitation of this study is that all births were hospital-based. However, this factor is minimal because the rate of supervised delivery in Morocco is 74% [13], and women with severe complications are generally referred to hospitals. Despite this limitation, our study is the only one in Morocco that provides information about near-miss women’s experiences and the consequences of a near-miss event in the late post-partum period (8 months). The prospective study design helped to avoid recall bias. We achieved a high follow-up rate (91%) as a result of telephone calls to the women who had not responded and by covering the participants’ travel expenses and meals. However, it may be worth to note that women who were lost to follow-up (9%) in our study were poorer, did not have health insurance and may therefore under-represent some of the problems. The third limitation is that we did not conduct all of the in-depth interviews at the women’s homes; 15 women were invited to meet at an accessible place of their choice instead. However, all of these women participated, and their privacy and confidentiality were respected.

Conclusion

Special attention to maternal morbidity is crucial for designing post-2015 sustainable development goals. Near-miss cases represent a high-risk category that policymakers and clinicians should consider when developing specific strategies for near-miss follow-up. This follow-up should involve husbands and the nearest family members because they play an important role in providing emotional and financial support. Policymakers, researchers, civil society, donors and other stakeholders must develop new mechanisms and financial support for women to prevent near-miss situations and their consequences during the post-partum period. Such policies represent the necessary next step for improving the quality of maternal and newborn care.

Acknowledgements

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References

Consequences of maternal near-miss cases in Morocco


Appendix

Sahel et al. criteria for maternal near miss

| Severe preeclampsia and eclampsia | (a) Blood pressure >140/90 mmHg or a change in systolic blood pressure >30 mmHg or diastolic blood pressure >15 mmHg AND at least 1 of the following: convulsions, coma, jaundice, pulmonary oedema, severe oliguria, massive proteinuria, thrombocytopenia <100 000 platelets, eclampsia (at least 2 of the following symptoms: blurred vision, frontal headache, and epigastric bar) or(b)Seizures AND antihypertensive therapy or massive proteinuria or generalised oedema |
| Severe infection (a) and septic shock (b) | (a) Clinical diagnosis of sepsis mentioned in the file or (b) Temperature >39 or <36 °C or genitourinary infection AND one of the following signs: systolic blood pressure of 80 mmHg, jaundice, impaired consciousness, or oliguria <100 ml in 4 h |
| Disseminated intravascular coagulation | All |
| Hysterectomy | All |
| Placental abruption | All |
| Uterine rupture or pre-uterine rupture | All |
| Coma | All |
| Shock | All |
| Acute pulmonary oedema | All |

Source: Sahel et al. [16].

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