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Maternal near miss approach to evaluate quality of care in Alborz province, Iran

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ABSTRACT

Objective: the maternal near miss approach has been developed by World Health Organization for assessing and improving the quality of care. This study aimed to examine the incidence, characteristics, and features of the care provided for maternal near-miss cases in public and private hospitals in Alborz province, Iran.

Methods: a cross sectional, facility-based study was conducted in all 13 public and private hospitals of Alborz province between April 2012 and December 2012. The World Health Organization near miss criteria were applied to gather and analyse the data, and indicators related to maternal near miss, access to and quality of maternal care.

Findings: 38,715 deliveries were assessed. There were 38,663 live births, 419 (1.08%) had potentially life-threatening conditions and 199 had severe maternal outcomes (SMO) (192 near miss cases and 7 maternal deaths). The maternal near-miss ratio was 4.97 cases per 1000 live births. The incidence of severe maternal outcome was 5.15 cases per 1000 live births. Severe mortality outcomes index within 12 hours of hospital stay from admission (SMO12) was 3.52%. The proportion of SMO12 cases from the total SMO cases was 99.5%. The Intensive Care Unit (ICU) admission rate among women with SMO was 72.7%, while the overall admission rate was 0.7%. Overall, hypertensive disorder was the most frequent condition among women with potentially life-threatening conditions and maternal near-miss cases. Cardiovascular dysfunction and respiratory dysfunction were the most prevalent dysfunctions among maternal near miss (MNM) cases and maternal death cases respectively.

Key conclusions and implications for practice: the WHO maternal near miss criteria help to identify issues that may lead to life threatening conditions and can be used to monitor and improve the quality of care in maternity settings. Hypertensive disorders related to near miss conditions need more attention to prevent maternal severe outcomes in Alborz province. Most of the process indicators were not satisfactory. The WHO tool enables health managers to improve maternal health care.

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Introduction

Maternal mortality is an important health indicator worldwide and strongly depends on quality of care (Bruce, 1990). Despite evidence-based knowledge and practical guidelines, non-standard care of women with complications of pregnancy is still a serious problem worldwide. Therefore, using quality of care indicators to evaluate performance has a critical role in providing high quality services (Talungchit et al., 2013).

One strategy to improve quality of care in maternity services is assessment and review of maternal death records. However, due to relative low occurrence of maternal death, evaluation of severe acute maternal morbidity is considered an important indicator and helps to improve quality of maternal care (Tunçalp and Souza, 2014).

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In any setting, women who develop severe acute morbidity during pregnancy share many pathological and circumstantial factors related to their condition. While some of these women die, a proportion narrowly escapes death. By evaluating the cases on severe maternal outcomes (both 'near-miss' cases and maternal deaths), much can be learnt about the processes in place (or lack of them) to deal with maternal morbidities (World Health Organization, 2011). The WHO then developed a set of indicators for assessing the quality of care within a health care facility or health system. These indicators also provide information on intra-facility performance and on the extent to which the health system as a whole is successful in reducing delays for women in accessing a health-care facility or referral hospital (Say et al., 2009).

Definition and classification of near miss mothers in different studies vary widely (Baskett and Sternadel, 1998). In 2009, the World Health Organization (WHO) proposed a set of criteria for identifying women with life-threatening conditions during pregnancy, childbirth and the postpartum period, defined as maternal near-miss cases (Say et al., 2009). To identify maternal near-miss cases, WHO proposes a two- step process (World Health Organization, 2011). The first step is to detect women who had severe pregnancy related complications (Potentially life-threatening conditions), that are identified based on whether they had any severe complication (e.g. severe postpartum haemorrhage, severe pre-eclampsia, eclampsia, sepsis or severe systemic infection, ruptured uterus) or whether they received a critical intervention (e.g. admission to intensive care unit, interventional radiography, laparotomy, and use of blood products). The second step is based on identification of organ dysfunction by clinical, laboratory and management markers (Box 1). Indeed, a near miss is defined as a very ill pregnant or recently delivered woman who nearly died but survived a complication that occurred during pregnancy, childbirth or within 42 days of termination of pregnancy (World Health Organization, 2011). Organ dysfunction in life-threatening conditions (near miss criteria) includes; Cardiovascular, Respiratory, Renal, Coagulation/haematological, Hepatic, Neurological, and Uterine dysfunction. For more clarification, the terms and indicators used are listed in the Table 1.

On the basis of the WHO world health statistics (2014), in 2013, nearly 800 women died daily from maternal causes. Almost all of these deaths (99%) occur in developing countries, of which majority could be prevented in the presence of appropriate and necessary medical interventions. The key obstacle is the lack of access to quality care by pregnant women before, during and after childbirth (World Health Organization, 2014).

Iran has been successful in achieving the Millennium Development Goals (MDGs), because programmes have been launched to reduce the maternal mortality ratio (Moazzeni, 2013). A death registration system has been developed to track and improve maternal quality of care and the MMR was decreased from 245 in 1980 to 23 in 2013 per 100,000 live births in Iran (World Health Organization, 2014). National programmes have been implemented in order to achieve a reduction in maternal mortality rate to 15 per 100,000 live births until 2015. Approximately, 80% reduction has occurred in the MMR in Iran from 1990 to 2008 (World Health Organization, 2010). In Iran a decline in maternal mortality partly appears to be related to essential investments in nationwide health services such as reducing communicable diseases, improving access and quality of health care services, especially prenatal and postnatal care services (World Health Organization and Centre for Health Development, 2003). In addition to these factors, many other elements such improving women's status, provision of improved education and greater acceptance of contraceptive methods were important factors influencing maternal mortality reduction (Asadi-Lari et al., 2004).

However, there is serious concern regarding the significant increase in caesarean section deliveries, mostly elective, and repeat caesarean deliveries. Due to changes in population policy and encouraging people to have more births, increased cesarean operations in Iran are associated with greater risks and inappropriate consequences for mothers and neonates (Badakhsh et al., 2012) that may put the mother at greater risk for severe pregnancy related complications (Belizan, et al., 2007).

Box 1–WHO criteria to identify potentially life-threatening conditions and near-miss (World Health Organization, 2011;Tuncalp and Souza, 2014)

Step 1: Maternal Severe complications

1. Severe postpartum haemorrhage
2. Severe pre-eclampsia
3. Eclampsia
4. Sepsis or severe systemic infection
5. Ruptured uterus

Critical interventions or intensive care unit use

1. Admission to intensive care unit
2. Laparotomy (including hysterectomy, excluding caesarean section)
3. Use of blood products
4. Interventional radiology

Step 2: life-threatening conditions (maternal near-miss criteria)
Clinical organ dysfunction

1. Acute cyanosis
2. Gasping
3. Respiratory rate >40 or <6 bpm
4. Shock
5. Cardiac arrest
6. Oliguria non-responsive to fluids or diuretics
7. Any loss of consciousness lasting >12 hours
8. Stroke
9. Uncontrollable fit/status epilepticus
10. Global paralysis
11. Jaundice in the presence of pre-eclampsia

Laboratory markers of organ dysfunction

12. O_2 saturation $<90\%$ for more than 60 minutes
13. PaO_2/FiO_2 <200 mmHg
14. Creatinine >300 lmol/ml or >3.5 mg/dl
15. Bilirubin >100 lmol/l or >6.0 mg/dl
16. pH <7.1
17. Lactate >5 mEq/l
18. Acute thrombocytopenia (<50 000 platelets)

Management-based proxies

19. Hysterectomy following infection or haemorrhage
20. Use of continuous vasoactive drugs
21. Cardiopulmonary resuscitation
22. Dialysis for acute renal failure
23. Any non-anaesthetic intubation or ventilation
24. Transfusion of >5 units of blood or red cells

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