

Obstetrics Risk Management in 5 Iranian Hospitals (Tehran-2012)

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Abstract

Background: Risk management is improving quality of health care services and creating a safer system of care. We determined the main maternal and fetal risks in five Hospitals (Tehran-Iran) to offer some practical strategies to decline obstetric adverse events and provide better pregnancy outcome. **Methods:** A descriptive, cross-sectional study was carried out in 5 Iranian hospitals (2011-2012). Twelve Obstetricians/perinatologists and midwives from 5 hospitals who were in charge of Maternity Units, were our assistants in these hospitals. We organized a secretariat including Obstetricians/perinatologists and midwives. The principles of Obstetrics Risk Management were introduced to them in a 2 days' workshop. Then the delegates from each hospital were asked to report the most common obstetrical complications of their hospitals. The main results were 24 complications. Then for sorting these risks we asked them to do scoring of the 24 complication with 1 - 10 grading in 4 aspects of probability of occurrence, possibility of prevention, priority of interventions and short term response to interventions. Post partum haemorrhage, labor management problems, and neonatal hypothermia got the highest scores in these regards, and then these 24 items were categorized in 2 groups of risk assessment and hospital management. Finally based on Risk Management Rules in Clinical Governance, the complications analysis was done with use of failure mode, effects analysis and practical strategies to decline obstetrical adverse events were suggested. **Results:** We understood all reported complications had common infrastructural problems: defects in Risk Assessment and Hospital Management Policies. We focused on basic infrastructural management in these 2 main subjects and in these two: our main problems were related to staff management and hospital management issues. **Conclusion:** Since managerial and staff dependent problems were our main problems, these two should be considered as our main priorities in risk management program.

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Keywords

Risk Management, Hospital Risk Reporting, Obstetrics, Labor, Delivery Room

1. Introduction

Clinical Governance is a valuable framework for assessment and improvement of service provision quality with a coherent program [1]. Risk management is one of the 7 pillars of clinical governance (patient and public involvement, education and training, use of information, risk management, clinical effectiveness, clinical audit, staff and staff management) that is not applicable alone [2]. Risk management is identification, assessment, control, and suggesting some interventions to minimize, or eliminate unacceptable risks [3]. It is a set of guidelines, protocol, steps, organizational and clinical procedures to decline hazardous and unexpected events for patients [4]. Improving the quality of clinical care provides an opportunity for safeguard clinical practice beside staff ability for high quality care [5].

Obstetrics beside aviation, nuclear power plants, military and chemical manufacturing were categorized as high hazardous industries. It shows the complexity of this field with a cascade of events leading to severe accidents. Obstetrics risk management is a paramount tool in preventing or reducing the adverse events for both patients and staffs. Although during recent years just a few percentage (0.7% - 0.9%) of obstetric patients need to be admitted in ICUs, incidence of severe maternal morbidity is rising [6]. In United Kingdom, 10.8% of obstetric cases faced a complicated situation in which one third of them will end in moderate-severe morbidities or even to death. It is estimated that, at least half of these poor prognostic events could be prevented [7].

Since early 20th century, many risk management strategies were applied to prevent and decrease maternal and neonatal mortality and morbidity [8]. The aim of risk management is improving quality of health care services and creating a safer system of care [9]. Recognition of risk: its potential, frequency and severity is the first step and its elimination is in the second place [10]. All health care staffs including physicians should be aware of the risk management principles. It is a tool to decrease both hazards and litigation [9]. Consequently by improving healthcare quality and safety, Risk Management will reduce financial burden in health care system [4].

This is one of the few studies in obstetric risk management in Iran. Our study attempts to identify fetomaternal risks in labour wards of 5 different hospitals (private, public and teaching public) in Tehran-Iran. In this article, we offer some practical risk management strategies to decrease obstetrical adverse events remarkably and provide better pregnancy outcome.

2. Material and Methods

This descriptive, cross sectional study was carried out in 5 different hospitals (Milad, Mostafa Khomeini, Vali-Asr, Khatamolanbia and Akbar abadi) in 2011-2012. We incorporated different types of hospitals (public, private, teaching). We organized a secretariat for this project including: 12 Obstetricians/perinatologists and midwives who were in charge of Maternity Units in these hospitals. A 2 days' workshop was held for them to get familiar with principles of Clinical governance including Risk Management. Then we asked each group of delegates from these hospitals to report the most prevalent complications and common errors in their labour and delivery-post partum ward, including maternal and neonatal life threatening events, and medico legal complaints. Reported complicated events are shown in **Table 1**.

In the next step we asked the participants to allocate scores 1 to 10 for each of the mentioned complication with respect to below mentioned indices:

- 1) Probability of complication occurrence;
- 2) Possibility of prevention;
- 3) Priority of interventions;
- 4) Possibility of getting favourable result in the short time with the least interventions.

Finally the expert panel including 14 members of the Obstetrics & Gynecologists (4 members), Perinatologists (3 members), Midwives (6 members) and Neonatologist (1 member) cooperated in evaluation and analysis of the results related to common errors and their causes. The expert group based on the results, concluded that post partum haemorrhage, labor management problems, and neonatal hypothermia were the most prevalent

Table 1. Reported complicated events.

Complications	
1	Routine episiotomy
2	Routine induction/Augmentation
3	Use of Expensive Diagnostic Tests first place
4	Latent Phase admission and mismanagement of these patients
5	Accidents in neonatal transfer including dropping down of the Neonates
6	Failed documentation of neonatal sex
7	Patient identification by Bed Number
8	Lack of uniform protocols in obstetrics management
9	Indecisiveness or delayed decision making in management
10	Post partum mismanagement/PPH
11	Poor follow up of laboratory test results
12	Erroneous drug or blood products prescription to patients
13	Retained vaginal tampon
14	Problems in neonatal resuscitation
15	Errors in drug dose estimation (e.g. Magnesium Sulphate)
16	Poor attention to Parturient Nutrition
17	Unnecessary lab requests
18	Haste in placental extraction, neglects in controlling uterine contractions
19	Delayed or poor monitoring of post partum haemorrhage
20	Absent or delayed screening of high risk pregnancies
21	Neglected lacerations (grade 3, 4)
22	Neonatal hypothermia
23	Delayed diagnosis of vaginal hematomas
24	Neglects or errors in fetal heart monitoring

complications. Then based on Risk Management Rules in Clinical Governance, the complications analysis was done with use of failure mode and effects analysis:

- 1) We examine the process in all these complications.
- 2) Identify the “failure modes”.
- 3) Establish the consequences (effects) of each failure mode.
- 4) Identify contributory factors.
- 5) Determine the Weight of contributory factors and/or failure mode regarding its frequency or possibility of occurrence.
- 6) Identify factors that could prevent, detect, monitor or mitigate this risk).
- 7) Prioritizing the risks.
- 8) Design an action Plan.

The results were that the main pitfall of most of these complications arise from poor screening and recognition of high risk patients as well as deficient policies in service provision in all these 5 hospitals (**Table 2**), and deduced that addressing common infrastructural problems, will help us in designating the plan of management.

After some interviews and discussion with the experts, we proposed some basic changes for better service provision.

Table 2. Classified reported complicated events.

Risk assessment	Hospital management policies
Unnecessary laboratory requests	Routine episiotomy
Haste in placental extraction, neglects in controlling uterine contractions	Routine induction/Augmentation
Delayed or poor monitoring of post partum haemorrhage	Use of expensive diagnostic tests first place
Absent or delayed screening of high risk pregnancies	Latent phase admission and mismanagement of these patients
Neglected lacerations (grade 3, 4)	Accidents in neonatal transfer including dropping down of the Neonates
Neonatal hypothermia	failed documentation of neonatal sex
Delayed diagnosis of vaginal hematomas	Patient identification by Bed Number
Neglects or errors in fetal heart monitoring	Lack of uniform protocols in obstetrics management
	Indecisiveness or delayed decision making in management
	Post partum mismanagement/PPH
	Poor follow up of laboratory test results
	Erroneous drug or blood products prescription to patients
	Retained vaginal Tampon
	Problems in neonatal resuscitation
	Errors in drug dose estimation (e.g. Magnesium Sulphate)
	Poor attention to parturient nutrition

Our study was approved by the ethic committee of Tehran University Medical of Sciences on 2011.10.29 (ID: 90-04-159-17420).

3. Results

We found that the most prevalent complications in these hospitals were post partum haemorrhage, labor management problems, and neonatal hypothermia. We also observed that these risks were similar and their main problems were due to deficiencies in infrastructures. We categorized all main infrastructural problems/management in two divisions: Outpatient and in patients and then determined how some factors can affect risks, **Table 3, Table 4**.

In inpatient-outpatient risk management approach, we use the comprehensive patient safety strategy on obstetrics events. We analyzed the contributory factors based on five items including organization and management, human factors, environmental factors, technology factors and maternal related factors **Table 5, Table 6**.

Based on finding common infrastructural problems were defects in Risk Assessment and Hospital Management Policies. We focused on basic infrastructural management in these 2 main subjects. Our main problems in these two fields were related to staff management and hospital management issues.

4. Discussion

Maternal mortality rate (MMR) in Iran has declined from 120 in 1990 to 21 in 2010 (comparable with developed countries) and we are going to maintain our achievements in Maternal Health. Iran is the 7th successful country that has fulfilled the Millennium Development goal with 81% reduction in MMR [11].

Despite this triumph, direct causes like postpartum hemorrhage (27%) and preeclampsia (13%) are still the major causes of maternal death in Iran [12]. Using the principles of risk management could be an essential approach in reducing complications.

The main strengths of this study were incorporation of different type's hospitals (public, private, teaching). So

Table 3. Out patients’ risks management.

Measures	Failure mode	Consequence	Contributory factor
<ul style="list-style-type: none"> High risk screening High risk pregnancy referral to Higher maternal care level High risk pregnancy follow up 	<ul style="list-style-type: none"> Missed high risk mothers 	<ul style="list-style-type: none"> Delayed or non referral to high risk units Maternal morbidity and mortality 	<ul style="list-style-type: none"> Over crowded clinics Transient staff Poor counselling Poverty, expensive lab tests and poor insurance coverage Poor maternal cooperation due to socio-cultural belief Poor follow up system in high risk mothers Deficient file registration Poor access to maternal health file data

Table 4. In patients’ risks management.

Measures	Failure mode	Consequence	Contributory factor
<ul style="list-style-type: none"> Recognition of high risk Mothers Consultation and lab test request Referral of high risk mothers to Higher Levels of care Provision of appropriate care for high risk patients Recognition of danger signs and possibilities of transformation of low risk patients to high risk Provision of appropriate post partum care Follow up especially for high risks up to 42 days 	<ul style="list-style-type: none"> Inability to screen and recognize risks and failure to deliver adequate needed care Inaccessibility of prenatal care file Reluctance of high risk mothers for going to higher level of care 	<ul style="list-style-type: none"> maternal/neonatal morbidity and mortality 	<ul style="list-style-type: none"> Inadequate /inefficient Staff training programs Poor audit and feedback Lack of supporting referral system Lack of skills and information Lack of coordination in different levels of Care Lack of follow up system Poverty Poor insurance coverage Socio-cultural problems

Table 5. Different groups of contributory out patient’s factors.

Organization and management	Human factors	Environmental factors	Technology factors	Maternal related factors
<ul style="list-style-type: none"> Overcrowded clinics Transient staff Poor follow up system in high risk mothers Inappropriate registry system Poor access to maternal health data Lack of coordination in different levels of care 	<ul style="list-style-type: none"> Poor counselling with high risk mothers 	<ul style="list-style-type: none"> Expensive lab tests Poor insurance coverage 	----	<ul style="list-style-type: none"> Poverty

Table 6. Different groups of contributory inpatients factors.

Organization and management	Human factors	Environmental factors	Technology factors	Maternal related factors
<ul style="list-style-type: none"> Poor system provision of adequate training Poor audit and feedback Lack of coordination in different levels of Care Lack of follow up system 	<ul style="list-style-type: none"> Lack of skills and information 	<ul style="list-style-type: none"> Poor insurance coverage 	<ul style="list-style-type: none"> Arterial Blood Gas Doppler Fetal Monitors Holter Monitors Infusion Pumps 	<ul style="list-style-type: none"> Poverty Socio-cultural problems Poor Insurance Coverage

this strategic planning can be implemented in our different hospitals and even in other developing countries with the same pattern of maternal risks, as well.

Our accumulated data gathering from 5 hospitals showed that the post partum haemorrhage, labor management problems, and neonatal hypothermia were the most prevalent complications. Others studies also showed these high prevalence complications: Almeida *et al.* reported of 1764 neonates, Hypothermia 5 minutes after birth and at NICU admission was 44% and 51%, respectively [13]. Cheng *et al.* also pointed to 25% of maternal deaths attributed to postpartum haemorrhage (PPH) in developing countries [14]. Duncan *et al.* demonstrated that poor progress is the most common reason given for medical intervention in labour and failure to recognize the variety of underlying causes leads to suboptimal care [15].

We saw that our main pitfalls are not related to technologic deficiencies but dramatically associated with managerial and organizational deficiencies. Problems related to human factors were at the second level and environmental, social and technologic bond problems were at the end of the list. Our results were consistent to other studies: Verbano in 2004 has rendered a risk categorization related staff and hospital management issues [4]. Cottee *et al.* also confirmed that Risk management strategies should cover branches related policy making, guideline, human factor (and it's relation with tool and environment), environmental and financial aspect, technology and equipments, audit and education [3] [9]. Sultan *et al.* reported that in critical care services, providing labour-ward staff with adequate knowledge, practical skills and infrastructure is necessary [16].

Since we have mainly managerial and staff dependent problems (affecting maternal health which are amendable with a comprehensive program with clinical governance approach) we suggest a pathway for improvement of these two.

Step 1. Organization and management

Focus on managerial factors in 3 categories:

- Training;
- Provision of appropriate referral system;
- Provision of follow up system.

Training:

In obstetrics we are not able to predict all emergency condition. People who involve cares for pregnant mothers have to be aware and be trained for responding to emergencies [17]. In the United Kingdom more than 90% of OB ward staffs have been trained annually [9]. Different Types of errors (intended and unintended) may occur in recognition, attention, memory and selection during working hours. Some error may happen due to mistake or violation [7]. Studies have shown that training and education decrease the risk of error to one quarter [10]. So we think that:

- It is a must for every personnel working in prenatal clinic or labour ward to have adequate competencies which should be provided by Training Courses.
- Arranging appropriate training courses (verbal and practical training), pre service and in service. During Which gaining acceptable grade is obligatory for passing the course.
- For personnel's error: a system provision of training courses should be provided.
- Simulation/drill courses for rare but fatal complications such as eclampsia would be efficient. There are some rare situations that staffs may not have faced before, like shoulder dystocia, vaginal breech delivery, cord prolaps. These simulation courses would be beneficial [7].
- Provision of training file for each staff to record their activities and their grades which should affect their annual promotion.

Provision of appropriate referral system:

Timely recognition of the risks and Referral Of obstetric Patients can play a life saving role in emergency treatments and has crucial effects on the pregnancy outcome. [18]. Predicting which pregnant mother will experience high risk condition is difficult, so for all pregnant women there should be an efficient risk screening and referral system. Referring mothers at the onset of life-threatening complications has a great value and increases the use of available hospital services [19]. In order to recognize high risk pregnancy sooner and on time referral, we suggest:

- Every pregnant woman should have a file (either electronic or Hard Copy) which shows her health status. It should be presentable wherever she goes (In this comprehensive file, there should be a description of all health data including her risk factors and chronic diseases if any).
- There should be an alertness about the possibility of transformation of Low risk Pregnancies to High Risk

cases, so a complete history taking and risk assessment should be a Must in this regard.

- The access to electronic file or hard copy should be possible 24/7, so nothing would be missed whenever the patient comes to the same emergency unit.
- At the same time the patient should have a summary of her health status as a hard copy, so that if she goes to anywhere else, she will be cared in the best way.
- In crowded clinics, the patients should be triaged based on their risk factors, and there should be time scheduling, to prevent over crowdedness especially for high risk pregnancies.

For determining the exact method of Management in High Risk Patients:

1) Upon recognition of the High Risk Patients, She should be referred to higher level of care for determining the best plan of management for the following remaining months of her pregnancy, with special attention to the best place for her prenatal care programs and delivery (Both should be determined in the referral report.).

2) Once the high risk patient has been recognized, she should be targeted for follow up program up to the end of Post partum Period.

3) These program includes those mothers with sudden changes from Low risk ones to high risk population as well.

4) Provision of outreach programs.

Provision of Follow up System:

Previous reports confirmed some problems in evaluation of risk presented by women due to inadequate follow-up during the pre and postpartum period. Arulkumaran in his study indicated that in England (2007) about 89% women were satisfied with care in labour and birth but this satisfaction in post natal period had not been justified [5] [20]. We speculated that some measures could be beneficial:

- A system should be foreseen for follow up, in which high risk patient either during prenatal care or postpartum period will be followed. Nothing should be missed even based on the infrastructure: a follow up software can help.
- This follow up system should include antenatal breastfeeding and child birth preparation training course and problem solving session in the postpartum as well as looking for high risk mothers' welfare.
- In this system which should be linked to the Hospital official jobs a group of midwives will be in charge, for training courses and in each shift, but in the case of high risk recognition and reporting, every midwife in shift should report the above mentioned patients for targeting and follow up from that time, which necessitates the presence of a good registry system in the hospital.
- There should be cooperation outside the hospital with the health centres for further follow up.
- There should be an alert system in this follow up system.
- For referral Patients, a detailed feedback report should be provided.

Step 2. Human Factors

Failure to monitor, observe, or act, delay in diagnosis, incorrect risk assessment, inadequate handover, no attention to out of order equipment, no preoperative checks, not following protocol, not seeking necessary helps, failure to manage adequately a junior member of staff, incorrect applied protocol, treatment given to incorrect body site and wrong treatment given, all of them are reported as human factors in risk management [21] however, human factors are partly related to managerial system and partly are individual dependent so these 2 should be approached as follows:

Managerial problems which should be corrected:

- Lack of Guidelines and Protocols which makes correct management difficult.
- Lack of uniform policy in managing the patients.
- Poor attention to eligibility criteria in job description.
- Lack of policies to determine competencies before starting the Job and inadequate supervision programs.

For reversing the process, there should be a strong willingness to:

- foresee the necessary guidelines and protocols to make a uniform plan of management and using competent professional personnel's to take charge with adequate Audit and Feedback.

Personal Problems which as well are a mirror effect of poor managerial policies should be solved in these ways:

- Active participation in training courses is a must.
- Jobs should be allocated based on profession.
- In each departments expert people should be involved, and in the absence of the main person, someone with

the same profession and competencies (familiar with the system) should be replaced even in the short term.

- Rotational working or staff turnover is not beneficial, neither for the system nor for the patients. It should be prevented.
- If an error (after auditing the problem) has indicated human factors, the involved person or team should be evaluated about their competencies and scheduling necessary training courses. Condition, frequency, degree and causes of error occurrence should be evaluated, too [7].
- If a recurrent error from the same person is observed, her/his continuing work in the same job is to be reconsidered.

Least but not the Last is the necessity of active audit and feedback in risk management, which could guarantee system improvement, and for this essential improvement, there should be a multidisciplinary team.

5. Conclusion

In our obstetric hospitals, most common complications had similar managerial and staff dependent problems. We need to focus on the roots and infrastructural structures then apply pathways for improvement of these two.

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