‘‘Near Miss’’ Obstetric Cases: 4 Years Experience of a Tertiary Center

Hüseyin CENGİZ[1], Cihan KAYA[1], Ramazan ATEŞ[2], Yusuf Ziya YENER[3], Murat EKİN[1], Levent YAŞAR[1]

İstanbul, Turkey

OBJECTIVE: To evaluate the frequency of near miss and the nature of near miss events, and comparatively analyze near miss morbidities among pregnant women managed in our institution over a 4-year period.

STUDY DESIGN: The study was conducted in Bakırköy Dr. Sadi Konuk Education and Research Hospital. Cases were identified through a retrospective analysis of hospital records of pregnancy-related complications reported between January 1, 2008 and December 31, 2011. For each case of near miss morbidity and maternal death, data on demographic characteristics were collected, including the patient’s age, parity, previous deliveries, and gestational age at delivery. Data on the nature of obstetric complications, the location where they developed (home, private doctor’s office, maternity center, or hospital), type of delivery, fetal outcomes, and length of stay in the intensive care unit (ICU) were collected.

RESULTS: During the study period, 6833 adults required ICU admission; 41 (0.60%) of them were obstetric patients. The total number of births reported during the study period was 9841. The mean age of the patients was 28.5 years (range, 17-52). Six women (14.6%) were admitted before and 35 (85.4%) after childbirth. The most common diagnosis was preeclampsia (41.5%), followed by obstetric hemorrhage (29.2%).

CONCLUSION: Maternal health care policies need to be concerned with preventing near miss cases.

Key Words: Intensive care, Maternal health, Maternal mortality, Turkey

Gynecol Obstet Reprod Med 2013;19:19-22

Introduction

It is estimated that 536.000 women die from pregnancy or childbirth-related complications every year, with 99% of cases occurring in developing countries.[1] A decline in the number of maternal deaths in developed countries has stimulated an interest in investigating cases of life threatening obstetric morbidity or near miss.[2] The concept of “near miss” has recently been introduced with regard to maternal mortality. Near miss is a serious adverse event that leads to harm and morbidity in the mother, but she survives.[3] The reported prevalence ranges from less than 1 per 1000 live births to 82 per 1000 live births, with rates in resource-poor settings ranging from 4% to 8% of hospital-based deliveries.[4,5]

[1]Bakırköy Dr Sadi Konuk Education and Research Hospital, Department of Obstetrics and Gynecology, [2]Department of Family Medicine, [3]Department of Anesthesiology and Reanimation, İstanbul

Address of Correspondence: *Cihan Kaya*
Tevfik Sağlam Street, No: 11,
Zuhuratbaba, Bakırköy, Istanbul
drcihankaya@gmail.com

Submitted for Publication: *25. 03. 2013*
Accepted for Publication: *05. 04. 2013*

We conducted a retrospective study to determine the frequency of near miss (severe acute maternal morbidity) and the nature of near miss events, and comparatively analyzed near miss’ morbidities among pregnant women managed in our institution over a 4-year period.

Material and Method

The study was conducted in Bakırköy Dr Sadi Konuk Education and Research Hospital, one of the tertiary care centers in Istanbul, the biggest city in Turkey, which has an 18-bed intensive care unit (ICU) with approximately 3000 annual patients. The intensive care and obstetric unit serves as the major referral center for other public and private hospitals in the western part of the city. The center provides emergency obstetric and gynecological care 24 hours a day.

Near miss events are defined as acute obstetric complications that immediately threaten a woman’s survival but do not result in her death either by chance or because of the hospital care received during pregnancy, labor, delivery, or within 6 weeks after termination of pregnancy[6] and a near miss case defines a patient with at least one near miss event. Cases were identified through a retrospective analysis of hospital records of pregnancy-related complications reported between January

1, 2008 and December 31, 2011. For each case of near miss morbidity and maternal death, data on demographic characteristics were collected, including the patient's age, parity, previous deliveries, and gestational age at delivery. Data on the nature of obstetric complications, the location where they developed (home, private doctor's office, maternity center, or hospital), type of delivery, fetal outcomes, and length of stay in the ICU were collected.

Data were analyzed using the Statistical Package for Social Sciences for Windows (SPSS, version 15.0).

Results

During the study period, 6833 adults required ICU admission; 0.60% were obstetric patients. The total number of births reported during the study period was 9841. Forty-one women required ICU admission. The mean age of the patients was 28.5 years (range, 17-52). Six women (14.6%) were admitted before and 35 (85.4%) after childbirth. Sixteen women (39%) were referred to our hospital after delivery. The mean length of ICU stay was 49 hours (range, 4-240 hours), and the mean length of hospitalization after discharge from ICU was 4.5 days (range, 1-22 days). Thirty-eight (92.7%) women did not receive antenatal care during pregnancy. The demographic characteristics of the near miss patients are shown in Table 1.

Table 1: Demographic characteristics of the near-miss patients

Patient demographics	Mean±SD	Minimum	Maximum
Age	28.5±7,362	17	52
Gravidity	1.95±1,161	1	6
Parity	1.63±1,178	0	6

SD; standard deviation

The most common diagnosis was preeclampsia (41.5%), followed by obstetric hemorrhage (29.2%). Eclampsia occurred in 11 cases (26.8%). One patient was referred for cardiac failure after childbirth (aortic stenosis). Of the 28 women with hypertension requiring ICU admission, 9 were diagnosed with the HELLP (hemolysis, elevated liver enzymes, and low platelet count) syndrome (21.9% of all ICU admissions.) Twelve women were admitted for obstetric hemorrhage of which 3 underwent hysterectomy. There were no maternal deaths, but 2 (4.8%) perinatal deaths were reported.

All of the patients, except 1, had cesarean delivery. Only 1 patient had complications in the ICU. One eclamptic patient had a cerebral infarct that was managed successfully. The most common interventions during ICU admission were transfusion of blood products (40%), artificial ventilation (19.5%), and the administration of antihypertensive drugs (73.1%) and magnesium sulfate (51.2%) (Table 2).

Table 2: Near-miss patients; admission, primary diagnosis, delivery method, complications, interventions and outcomes

Near-miss patients	Total (n=41)
Admission	
Antepartum	6 (14.6%)
Postpartum	35 (85.4%)
Primary diagnosis	
Preeclampsia	17 (41.5%)
HELLP-syndrome cases	9 (21.9%)
Eclampsia	11 (26.8%)
Obstetric hemorrhage	12 (29.2%)
Aortic stenosis (cardiac failure)	1 (2.5%)
Delivery Method	
Caesarean section	40 (97.6%)
Vaginal birth	1 (2.4%)
Complications	
Cerebral infarct	1 (%2.5)
Interventions	
Hysterectomy	3 (7.3%)
Transfusion of blood products	14 (40%)
Anti-hypertensive drugs	30 (73.1%)
Anti-convulsive drugs	21 (51.2%)
Outcomes	
Pregnancy-related mortality	-
Perinatal mortality	2 (4.8%)

Discussion

There is no consensus regarding the definition of near miss, which has evolved from the general clinical concepts of obstetric morbidity to those of organ dysfunction.[6-8] In the present study, we used the description of near miss cases reported in 2004.[6] The percentage of pregnant women requiring ICU admission was 0.41%, which is similar to the numbers reported in the literature, 0.11-0.74%.[9-14] The near miss rate could reflect maternity care, and it is associated with a high-risk population and difficulties in gaining access to healthcare. Although the near miss rate in developing countries is similar to that in developed countries, the incidence of hypertension and obstetric hemorrhage rates are much higher in developing countries than developed countries. This inconsistency is possibly due to differences in the definition and identification of cases, which significantly limits the comparison of near miss data across institutions.[4,5]

In our study, 14.6% of ICU admissions were antepartum, which is a lower rate than that reported in other studies where the mean rate of antepartum admission was 39% (range, 22.1-62.4). [10,14-16] This difference resulted from the admission to our ICU of near miss women after giving birth elsewhere. The criteria for admission to the ICU vary between countries, hospitals, and clinicians, and the capacity and location of the ICU

influences the number of admissions.[14] In Scotland [17] only one-third (28%) of all near miss cases are admitted to ICU, and in Indonesia, this proportion is only 4.1%.[2] Generally, less than 10% of near miss cases in low-resource settings receive intensive care.[2,18] In our study group, all near miss cases were admitted to the ICU, but we do not have any data for the whole country.

The rate of diagnosis of preeclampsia in our study was higher than that in Western Countries with a mean rate of 34% reported in the literature.[9-12,19-21] In our study group, the most common diagnosis was preeclampsia (41.5%). However, in a study conducted in the Netherlands, Keizer et al. reported a higher percentage of preeclampsia (62%) than that in other Western countries. This high percentage is likely the consequence of the patient population, data collection, and nursing policies.[22] The results of our study show the importance of antenatal care as the preeclampsia rate was very high. Preeclampsia often presents as a very insidious disease, with an atypical presentation that can lead to serious delays in diagnosis and treatment.[22] The clinician should evaluate the patient very carefully. In developing countries, simple blood pressure monitoring can prevent or decrease maternal-fetal morbidity and mortality.

A high maternal mortality rate with septicemia and hemorrhage as the main direct causes was reported in a previous study.[23] However, we did not detect septicemia; this could be attributed to the location of the study in a hospital, which facilitated access to antibiotics. The rate of incidence of septicemia is likely to be higher in other parts of Turkey. On the other hand, obstetric hemorrhage is a concern in all parts of Turkey, and it can be caused by lack of pre and antenatal care. A study from the same hospital reported a 0.1% rate of intractable postpartum hemorrhage and no maternal deaths.[24] Likewise, there was no maternal mortality in the current study. This could be due to the availability of blood bank services, admission to ICU (all the near miss patients), and the introduction of magnesium sulfate as a preventive measure.

Advanced maternal age is associated with high-risk pregnancies.[25] In our study, 9 (21.9%) patients were ≥35 years old. Of these 9 patients, only 1 received prenatal care and none had antenatal care. These results are of concern and warrant further investigation. In the current study, 2 stillbirths were reported and both were caused by hypertensive disorders. Although both patients had received antenatal care in the second trimester of their pregnancies at least 3 times, they did not return to the hospital after the second trimester. This could be attributed to lack of antenatal care services, illiteracy, or rural residence.

For many years, decreasing the number of complications during pregnancy was the main objective of many programs aimed at reducing maternal morbidity and mortality. Nevertheless, the majority of acute, severe obstetric complications are considered difficult to predict and seldom possible to prevent. [26] Delayed ICU referral is a common problem in hospitals in developing countries, which can lead to serious events and adverse outcomes in ICU patients. Our institution received 16 referrals of which 14 were serious cases. Every hospital should have a triage algorithm managed thorough government health policies.

Our study had certain limitations such as the small number of near miss patients included in the analysis and inadequate data on the referred patients. In addition, the retrospective nature of the data collection may have introduced bias. Large, prospective, international, multicenter studies are necessary to further analyze the issues and find effective solutions.

Conclusion

"Near miss" events are important indicators for monitoring the quality of maternity services in health care facilities. A reduction of the present maternal mortality rate can be achieved by developing evidence-based protocols. Maternal health care policies need to be concerned with preventing near miss cases.

"Near Miss" Obstetrik Vakaları: Tersiyer Bir Merkezin 4 Yıllık Deneyimi

AMAÇ: Near miss olgularının sıklığını, seyrini ve merkezimizde 4 yıllık süre boyunca yönetilen near miss morbiditelerinin analizini değerlendirmektir.

GEREÇ VE YÖNTEM: Çalışma Bakırköy Dr Sadi Konuk Eğitim ve Araştırma Hastanesi'nde yürütülmüştür. Olgular 1 Ocak 2008 ve 31 Aralık 2011 yılları arasındaki gebeliğe bağlı komplikasyonlara ait kayıtların retrospektif analizi ile değerlendirilmiştir. Her bir near miss morbiditesi ve maternal ölüm için, hastanın yaşı, gravidası, paritesi, önceki doğumları ve doğum sırasındaki gebelik haftasını içeren demografik özellikleri toplanmıştır. Obstetrik komplikasyonların seyri ile ilgili olan; nerede meydana geldikleri (evde, özel muayenehanede, kadın hastalıkları merkezi ya da hastanede), doğum şekli, fetal iyilik hali ve yoğun bakım ünitesi (YBÜ)'nde kalış süresi ile ilgili veriler toplanmıştır.

BULGULAR: Çalışma süresince, YBÜ'ne 6833 hasta kabulü olmuş olup, bunların 41'ini (%0,60) obstetrik vakalar oluşturmuştur. Bu sürede bildirilen doğum sayısı 9841'dir. Hastaların ortalama yaşı 28,5 (en az-en çok, 17-52)'tir. 6 (%14,6) hasta doğumdan önce ve 35 (%85,4) hasta doğumdan sonra hastaneye yatırılmıştır. En sık tanı preeklampsi (%41,5), ardından obstetrik kanamadır (%29,2).

SONUÇ: Maternal sağlık politikaları near miss olgularının önlenmesine yönelik düzenlenmelidir.

Anahtar kelimeler: Yoğun bakım, Anne sağlığı, Anne mortalitesi, Türkiye

References

1. World Health Organization, United Nations Children's Fund, United Nations Population Fund, World Bank, 2007. Maternal Mortality in 2005: Estimates Developed by WHO, UNICEF, UNFPA and The World Bank. World Health Organization, Geneva.
2. Adisasmita A, Deviany PE, Nandiaty F, Stanton C, Ronsmans C. Obstetric near miss and deaths in public and private hospitals in Indonesia. BMC Pregnancy Childbirth 2008;12;8:10.
3. Nashef SA. Lancet 2003;361(9352):180-1.
4. Say L, Pattinson RC, Gulmezoglu AM. WHO systematic review of maternal morbidity and mortality: the prevalence of severe acute maternal morbidity (near miss). Reproductive Health 2004;17:3.
5. Minkauskien M, Nadisauskiene R, Padaiga Z, Makari S. Systematic review on the incidence and prevalence of severe maternal morbidity. Medicina 2004;404:299-309.
6. Ronsmans C, Filippi V. Reviewing severe maternal morbidity: learning from survivors from life-threatening complications. In Beyond the Numbers: Reviewing Deaths and Complications to Make Pregnancy Safer Geneva. World Health Organization 2004:103-24.
7. Stones W, Lim W, Al -Azzawi F, Kelly M. An investigation of maternal morbidity with identification of life threatening 'near miss' episodes. Health Trends 1991;23: 13-5.
8. Mantel GD, Buchmann E, Rees H, Pattinson RC. Severe acute maternal morbidity: a pilot study of a definition of a near miss. BJOG 1998;105:985-90.
9. Hazelgrove JF, Price C, Pappachan VJ, Smith GB. Multicenter study of obstetric admissions to 14 intensive care units in southern England. Crit Care Med 2001;29:770-5.
10. Mahutte NG, Murphy-Kaulbeck L, Le Q, Solomon J, Benjamin A, Boyd ME. Obstetric admissions to the intensive care unit. Obstet Gynecol 1999;94:263-6.
11. Loverro G, Pansini V, Greco P, Vimercati A, Parisi AM, Selvaggi L. Indications and outcome for intensive care unit admission during puerperium. Arch Gynecol Obstet 2001;265:195-8.
12. Quah TC, Chiu JW, Tan KH, Yeo SW, Tan HM. Obstetric admissions to the intensive therapy unit of a tertiary care institution. Ann Acad Med Singapore 2001;30:250-3.
13. Panchal S, Arria AM, Harris AP. Intensive care utilization during hospital admission for delivery: prevalence, risk factors, and outcomes in a statewide population. Anesthesiology 2000;92:1537-44.
14. Kilpatrick SJ, Matthay MA. Obstetric patients requiring critical care. A five-year review. Chest 1992;101:1407-12.
15. Gilbert TT, Smulian JC, Martin AA, et al. Obstetric admissions to the intensive care unit: outcomes and severity of illness. Obstet Gynecol 2003;102:897-903.
16. Afessa B, Green B, Delke I, Koch K. Systemic inflammatory response syndrome, organ failure, and outcome in critically ill obstetric patients treated in an ICU. Chest 2001;120:1271-7.
17. Penney G, Brace V. Scottish confidential audit of severe mater-nal morbidity. In First annual report 2003 Aberdeen. Scottish Pro-gramme for Clinical Effectiveness in Reproductive Health; 2005.
18. Oladapo OT, Sule-Odu AO, Olatunji AO, Daniel OJ. "Near-miss" obstetric events and maternal deaths in Sagamu, Nigeria: a retrospective study. Reprod Health 2005;2:9.
19. Selo-Ojeme DO, Omosaiye M, Battacharjee P, Kadir RA. Risk factors for obstetric admissions to the intensive care unit in a tertiary hospital: a case-control study. Arch Gynecol Obstet 2005;272:207-10.
20. Zeeman GG, Wendel Jr GD, Cunningham FG. A blueprint for obstetric critical care. Am J Obstet Gynecol 2003;188:532-6.
21. Olarra J, Longarela AM, Suarez L, Palacio FJ. Critically ill obstetric patients treated in an ICU. Chest 2002;121: 2077-8.
22. Keizer JL, Zwart JJ, Meerman RH, Harinck BI, Feuth HD, van Roosmalen J. Obstetric intensive care admissions: A 12-year review in a tertiary care centre. Eur J Obstet Gynecol Reprod Biol 2006;128:152-6.
23. Ali AA, Adam I. Lack of antenatal care, education and high maternal mortality In Kassala hospital, eastern Sudan, during 2005-2009. J Matern Fetal Neonatal Med 2011;24:1077-8.
24. Cengiz H, Yaşar L, Ekin M, Kaya C, Karakaş S. Management of intractable postpartum haemorrhage in a tertiary center: A 5-year experience. Niger Med J 2012;53:85-8.
25. Nelson-Piercy C, de-swiet M, Lewis G. Medical deaths in pregnancy. Clin Med 2005;8:11-2.
26. Rosenfield A, Maine D, Freedman L. Meeting MDG-5: an impossible dream? Lancet 2006;368:1133-5.