



Neonatal Outcome of Life-Threatening Acute Maternal Illness. Severe Antepartum Hemorrhages and Eclampsia in Tertiary Hospital

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Abstract

Objective: Maternal and neonatal outcomes of two serious obstetrical complications required intensive care admission.

Methods: This is a retrospective hospital-based study. Data for this study was derived from the Qatar Pearl-Peristat Neonatal and Maternal Registry. We targeted pregnant women who developed eclampsia or APH >1.0 L who required intensive care admission.

Results: Out of 23500 maternal cases reported in the registry suffered from pregnancy induced hypertension or APH of all grades. 43 cases were admitted to intensive care with a diagnosis of severe obstetric hemorrhage and 5 cases with a diagnosis of eclampsia. Only one mother died of hypertensive encephalopathy. Maternal hemorrhage was most common among multiparous women 36/43 (83%) while eclampsia was more among nulliparous women 4/5 (80%). The mean gestation age of newborn infants was 35 weeks \pm 3 in both groups, and the mean birth weight was 2.64 \pm 0.79 kilograms and 2.37 \pm 1.3 kilograms. The mean hospital stay was 11 \pm 4 days. One still born female in the eclampsia.

Conclusion: Obstetric severe hemorrhages and eclampsia carry a significant risk for both mothers and their newborns. The maternal and neonatal mortality is 2%, which is enough to warrant early and vigilant observation to women at risk.

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Keywords: Death; Eclampsia; Maternal; Antepartum haemorrhage; Neonatal; Outcome; Severe Morbidity.

Abbreviations: APH: Antepartum Hemorrhage.

Introduction

Maternity and childbearing are still two highly fragile truths. For a woman, becoming a mother and giving birth to a healthy baby is governed by many factors as the body undergoes a significant change during the entire pregnancy. Medical science has evolved in such a way that the expecting parents can witness the growth cycle of their tiny little bundle of joy through all modern facilities with a whole lot of expectations.

Looking at the other side of the coin, there are still women sadly falling prey to complications during their pregnancy which in turn affects their baby at birth and thereafter. Any unfortunate fluctuation in maternal blood pressure/preeclampsia/antepartum hemorrhage creates a huge havoc in the well-being of the newborn and the mother.



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Complications of pregnancy and childbirth are the leading causes of disability and death in women of reproductive age. This accounts for at least 18% of the global burden of diseases in this age group. The leading causes of maternal death and disability are closely linked to suboptimal maternal health care during pregnancy and inadequate care during delivery, including the new born [1]. Almost 8 million stillbirths and early neonatal deaths occur every year. In addition to maternal deaths, more than 50 million women experience maternal health problems annually [2]. In some countries, these maternal complications often impose a financial burden on women and their households [3].

Modern medicine has made labor and delivery much safer for both the mother and the baby, but complications still occur. The third trimester, starting from the 28th week till delivery, is the last lap of the journey in pregnancy, during which certain obstetric and medical problems can develop. This is also a crucial phase for the fetus to gain weight. The adverse events that occur during pregnancy influence both the short- and long-term health outcome of the newborn. The main potential complications for the mother in the third trimester are pregnancy-induced hypertension (pre-eclampsia and eclampsia), gestational diabetes, anemia, bleeding, placenta previa, abruption placenta, vasa previa, preterm labor, and premature rupture of membrane [4,5].

Eclampsia is a rare but serious complication of late pregnancy. It is defined as a severe complication of preeclampsia where high blood pressure results in the new onset of grand mal seizures and or comma. In high resource countries, the incidence of eclampsia is low and has been decreasing or stable at 1.5 to 10 cases per 10,000 deliveries [6-8]. In low and middle resource countries, however, the incidence varies widely: from 19.6 per 10,000 deliveries in parts of Zambia to 142 per 10,000 deliveries in Sierra Leone [9]. The relative risk of a woman with preeclampsia/eclampsia dying in the first 12 months following birth compared with normotensive women is significantly high [10,11].

Ante Partum Hemorrhage (APH) is defined as bleeding from or into the genital tract, occurring from 24+0 weeks of pregnancy and before the birth of the baby. The most important causes of APH are placenta previa and placental abruption, although these are not the most common. APH complicates 3–5% of pregnancies and is a leading cause of perinatal and maternal mortality worldwide. Up to one-fifth of very preterm babies are born in association with APH, and the known association of APH with cerebral palsy can be explained by preterm delivery [12].

Obstetric hemorrhage remains one of the major causes of maternal death in developing countries and is the cause of up to 50% of the estimated 500000 maternal deaths that occur globally each year [10]. In the UK, deaths from obstetric hemorrhage are not uncommon. In the 2006–08 report of the UK Confidential Enquiries into Maternal Deaths, hemorrhage was the sixth-highest direct cause of maternal death [13].

There are no consistent definitions of the severity of an APH, however, RCOG defines blood loss by a combination of volume and signs of clinical shock to guide management into 4 categories:

1. Spotting or staining, streaking or blood spotting noted on underwear or sanitary protection.
2. Minor Hemorrhage: blood loss less than 50 mL that has settled.
3. Major Hemorrhage: blood loss of 50 – 1000 mL, with

no signs of clinical shock and 4. Massive Hemorrhage: which is blood loss greater than 1000 mL and/or signs of clinical shock [14].

In the State of Qatar, the annual health report [15] for the healthcare services documented that complications of pregnancy, childbirth, and puerperium have increased in the last decade, and nearly 56% of women admitted to the Women's hospital were there because of complications of pregnancy and childbirth. There is no detailed study of serious maternity complications and their neonatal outcome. Though complications are not always dangerous, they generally have the potential to cause harm if not managed promptly and correctly. Early continuous prenatal care is associated with improvements in maternal and perinatal outcomes. Therefore, this study aimed to examine the neonatal outcome of two serious pregnancy-induced complications which are eclampsia and APH.

Methods

This is a retrospective hospital-based study. Data for this study was derived from the Qatar Pearl-Peristat Registry, which was developed in 2011 and reactivated in 2017 as Neonatal and Maternal Registry. The registry was funded by Qatar National Research Fund (QNRF). This retrospective study was conducted in state-run hospitals in Qatar with a focus on maternal and newborn registries with data covering the perinatal to postpartum periods. By utilizing patient care records, the study aims to examine the short and long-term maternal and newborn outcomes within the healthcare system. We retrieved the data from the medical records of each mother and infant.

Besides, the registry aims to investigate the development of specified sub-cohorts, with the intent to improve reproductive health outcomes of the population in Qatar. The registry obtained a general waiver of consent approved by the Institutional Review Board (IRB).

The Peristat registry houses delivery cohorts from 2011 to 2012 as the first phase and currently 2017 to 2019 as a second phase. This current phase is targeting around 35000 deliveries within the whole country. Data in the interim period from 2012 to 2016 was lacking in detail due to several confounders such as relocation of the hospital facility, introducing new electronic medical record system, and lack of funding during this period, which contributed to the inferior data quality.

Statistics

Patient data was inserted in dendrite data registry®, data analysis was performed with SPSS software, V.26.0.0.2 (SPSS Inc., Chicago, IL, USA). Continuous variables were presented as mean values \pm Standard Deviation (SD). Categorical variables were presented as percentages. Sample distribution data are presented as a histogram with relative frequency in percentages. The abnormal rate was presented as percentages.

Ethical approval

The data for this study were retrieved from PEARL MATERNAL & NEWBORN Registry and complemented with WWRC medical records. IRB/ Ethical approval was granted with a waiver of consent. WWRC is a member of the Vermont oxford database.

Results

Out of 23500 maternal cases reported in the registry, 43 cases were admitted with a diagnosis of severe obstetric hem-

orrhage of more than one liter of blood and 5 cases with diagnosis of severe eclampsia that required admission to obstetric intensive care. Only one mother with eclampsia died due to hypertensive encephalopathy.

Maternal hemorrhage was most common among multiparous women 36/43 (83%) while eclampsia was more among nulliparous women 4/5 (80%). All eclamptic mothers were non-nationals and had no antenatal care records. The mean age in the APH group was 34±4 vs 26±5 in eclampsia women. The mean gestation age of new born infants was 35 weeks ±3 in both groups and the mean birth weight was 2641 grams ±792 in hemorrhagic mothers versus 2389±1300 grams in eclampsia cases. Eclampsia happened in nulliparous women (80%) while hemorrhages occurred predominantly in multiparous (65%). Multiple pregnancies were noted in 5% of all cases. (Figure 1) More than half of new borns were admitted to NICU. The Apgar score at the 5th minute was virtually above 7, with no recorded cases of neonatal death.

Neonatal outcomes in acute maternal morbidities

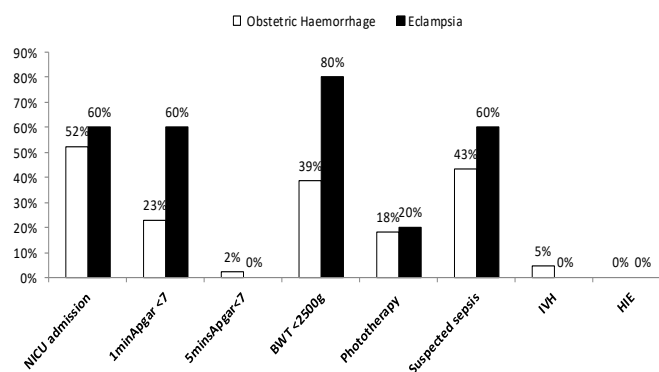


Figure 1

Table 1: Maternal characteristics.

| Maternal | Obstetric Hemorrhage ≥ 1.0 L No (n=43) n (%) or mean ± SD* | | Eclampsia (n=5) n (%) or mean ± SD* | |
|-------------------|--|-----|-------------------------------------|------|
| | n | % | n | % |
| Nationality | | | | |
| Qatari | 16 | 37% | 0 | 0% |
| Non-Qatari | 27 | 63% | 5 | 100% |
| Parity | | | | |
| Nulliparous | 7 | 16% | 4 | 80% |
| Parity 1-4 | 28 | 65% | 1 | 20% |
| Parity ≥5 | 8 | 19% | 0 | 0% |
| Age (years) | 34 | 4 | 26 | 5 |
| Mode of delivery | | | | |
| Caesarean section | 38 | 88% | 4 | 80% |
| Vaginal | 5 | 12% | 1 | 20% |
| Pregnancy type | | | | |
| Singleton | 41 | 95% | 5 | 100% |
| Twins | 2 | 5% | 0 | 0% |
| Maternal death* | 0 | 0 | 1 | 20% |

NA: Not applicable. *The died mother was 40 years of age

Discussion

In this era of absolute progress made by science and technology, common man is also able to understand life now is far different than how it used to be. Our ancestors lived in a time of utter uncertainty and little did they know that a birth in the family is a blessing without any untoward incidences. Revolution in all fields was a boon; for people realized the essence of education, knowledge and the implications it bought hence forth.

This study highlights the relationship between two of the most serious pregnancy complications and neonatal morbidity. Cesarean section was the main mode of delivery in both APH (88%) and Eclampsia (80%). Although not statistically signifi-

Table 2: Neonatal Outcomes.

| | Obstetric Hemorrhage ≥1.0 L (n=43) n (%) or mean ± SD* | | Eclampsia (n=5)n (%) or mean ± SD* | |
|-------------------------|--|-------|------------------------------------|-------|
| | n | % | n | % |
| Gestational age | 35 | ±3 | 35 | ±4 |
| NICU admission | 23 | 52% | 3 | 60% |
| Birth weight | 2.64 | ±0.79 | 2.37 | ±1.31 |
| Birth weight < 2.5 g | 17 | 39% | 4 | 80% |
| Female | 26 | 58% | 2 | 40% |
| Male | 19 | 42% | 3 | 60% |
| Live born | 44 | 98% | 5 | 100% |
| **Stillborn | 1 | 2% | 0 | 0% |
| Apgar score at 1st <7 | 10 | 23% | 3 | 60% |
| Apgar score at 5th <7 | 1 | 2% | 0 | 0% |
| Phototherapy | 8 | 18% | 1 | 20% |
| Suspected sepsis | 19 | 43% | 3 | 60% |
| IVH [§] I & II | 2 | 5% | 0 | 0% |
| HIE | 0 | 0% | 0 | 0% |
| Hospital stay(days) | 11 | ±4 | 10 | ±4 |

** Stillborn at 38 weeks gestation; 2.66 kg. [§]No reported cases of IVH grade II or IV

cant, four observations were noted from the maternal data, the first was the majority of hypertensive and all eclamptic mothers were among expatriates and non-nationals which might reflect lack of antenatal follow-up, unknown past medical history, the influx of expatriate families to the country without adequate health insurance that enables them to afford health care in the private sector. The second observation was the prevalence of APH among multiparous women while eclampsia occurred predominantly in primigravida women. The third observation was the maternal age where APH was common among mothers older than 34 years of age while eclampsia occurred virtually among younger mothers. The 5 cases of eclampsia happened

among the Asian non-Qatari population. A review of eclampsia in the state of Qatar over twenty years reported a prevalence rate of 3.1 per 10,000 deliveries [16]. In this study we report 5/23500 deliveries over 24 months which bring the rate down to 2.1 per 10,000 deliveries.

The neonatal outcome was more than satisfactory with no recorded mortality. Although the rate of prematurity was high (40%), the mean gestation age was 35 weeks which facilitated fewer NICU admissions (50%), shorter hospital stays (11± days), and manageable birth weight. At birth, few babies required resuscitation with Apgar score at fifth minute less than 7 particularly in APH (23%) while 60% of babies of eclamptic mothers did require initial support in the delivery room. None of them required intubation or were subjected to hypoxic-ischemic brain insults. All were discharged in good condition within 10 to 14 days from admission to NICU. 80% of the newborn of eclamptic mothers were LBW (<2500 gram) which reflect the placental insufficiency during pregnancy. Complications like NICU admission, low 1 min Apgar score, birth weight <2.5 kg, phototherapy, suspected sepsis were all higher in a neonate born to mothers with eclampsia compared to maternal APH. In high resource countries, the incidence of eclampsia is low and has been decreasing or stable at 1.5 to 10 cases per 10,000 deliveries". Bener et al reported an overall prevalence of APH among Arab women residing in Qatar as 15.3% with 6.7% among Qataris and 8.6% among non-Qatari Arab women; the difference in ethnicities was not significant. He as well did not identify any major risk on newborns at birth. In his study, he reported a low Apgar score at the first minute but not in the fifth minute of birth as well no major risk factor of IUGR or neonatal sepsis. However, he reported a significant increase in congenital anomalies. Among the 43 newborns belong to severe APH mothers, no congenital anomalies were detected [17].

The limitation of this study: Eclampsia is a serious but relatively rare disease with grave perinatal consequences particularly on the mothers. However, APH is more common and has a deleterious effect on both mother and her fetus. Although this recent report of eclampsia rate is showing improvement from that reported 10 years ago, still the sample size is small.

The main goal of this study was to report the outcome of two life-threatening maternal complications. The study has shown a significant impact on neonatal morbidity. Low Apgar score in 1 minute while low birth weight was more among mothers with eclampsia. Maternal hemorrhage was also significantly higher among multiparous women. While Obstetric hemorrhages and eclampsia carry a significant risk on both mothers and their newborns, maternal mortality and neonatal mortality was 2% and that is enough to warrant early and vigilant observation to women at risk.

Conflict of interest

All authors declare that they have no conflict of interests. The sponsor of the study had no role in study design; in the collection, analysis and interpretation of data; in the writing of this report; in the decision to submit the paper for publication.

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