MJMR, Vol. 34, No. 1, 2023, pages (338-343).

Open Access
ISSN:2682-4558

Research Article

Prognosis and Risk Factors of Hemorrhagic Shock Status in Minia Maternity University Hospital: A Prospective Study

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DOI: 10.21608/mjmr.2022.146070.1104

Abstract

Objective: In MINIA maternity university hospital, researchers sought to determine the frequency and early diagnosis of hemorrhagic shock in obstetrics. **Study Design: The** research was carried out at Egypt's MINIA maternity medical university, which is a referral center. That was prospective research with descriptive and exploratory purposes that ran from January 1 to June 30, 2022. For secondary research, a collection of 51 pregnant and postpartum women that experienced hypovolemic shock was employed. Researchers examined well how three adverse maternal outcomes—death, severe maternal result (death as well as severe end organ dysfunction morbidity), as well as combined severe maternal and critical interventions outcome—could be predicted by pulse, systolic blood pressure, diastolic blood pressure, shock index, mean arterial pressure, or even pulse pressure (death, severe end organ dysfunction morbidity, intensive care admission, and perinatal death). **Results:** A total of 972 obstetrical crises were documented. A total of 51 female patients had hemorrhagic shock, resulting in a hospital-based frequency estimate of 5.24 percent. The patients were on average 27.06.3 years old. Twenty-six percent of the patients were aged 20 to 24 years old. Hemorrhagic shock had a mortality rate of 9.8%. Hemorrhagic shock was responsible for 38.46 percent of all deaths in the medical unit over the same timeframe, according to the thirteen fatalities documented. Uterine rupture (p=0.0000), coagulation abnormalities (p=0.0000), and Glasgow score 9 (p=0.0285) have been the risk variables that were substantially associated with maternal fatality. **Conclusion:** In the Minia maternity university hospital, obstetrical hemorrhagic shock was widespread. Despite multimodal therapy, it has a significant mortality rate

Keywords: Maternal mortality, hemorrhagic shock, and prognosis

Introduction

Maternal mortality decrease is indeed a top concern in reproductive health, especially in poor nations. In reality, the World Health Organization (WHO) estimates that 850 women die every day throughout the world from complications pregnancy related, delivery, or postpartum.99 percent of these deaths take place in developing countries altogether. Northern and southern countries have drastically different rates of maternal mortality, with 239 instances per 100,000 births with underdeveloped nations and just 12 fatalities per 100,000 births among prosperous nations. Maternal mortality is caused by haemorrhages in more than 80% of instances, with 95% of these cases being avoidable, according to WHO. [1] As per research done in 2013 at the Minia maternity university hospital, the maternal death rate was predicted to be 400 per 100,000, with hemorrhagic crises coming in second (21.7%) behind dystocia (32.1 percent). Obstetrical bleeding can quickly progress to hemorrhagic shock that can be fatal to a mother. Tissue hypoxia, organ failure, and discomfort are all symptoms of hemorrhagic shock.[2] The focus of its treatment is on addressing both the cause and the

consequences of bleeding, particularly in terms of hemodynamic status and homeostasis. [3–5]

The abruptness of a shock, a lack of or paucity of intensive care supplies (blood and blood derivatives), skilled medical professionals, and poor socioeconomic status of the population make managing it difficult in undeveloped countries. [6] The incidence, prognosis, and risk factors for hemorrhagic shock in the Minia maternity led us to make this decision.

Framework and methods of study

The study was carried out at Egypt's MINIA maternity university hospital, which would be considered a reference institution. That was a progressive study with descriptive purposes that ran from January 1 to June 30, 2022. The study would include all women who have been admitted to the MINIA maternity university hospital's emergency room with hemorrhagic shock and were being treated as an obstetrical emergency. The research involves all pregnant and postpartum women that presented with hemorrhagic shock due because of an obstetrical etiology. Shock was described as just a heart rate of greater than 100 bpm, a blood pressure of less than or equal to 100/60 mmHg, a breathing rate of 20 to 30 cycles per minute, severe anxiety, and thirst.

The study looked at instances of shock without bleeding, as well as cases of hemorrhagic shock that happened outside of pregnancy or just after delivery. A thorough search was conducted to find patients who met the requirements for the research. Sociodemographic characteristics, medical history, patient clinical condition, and bleeding etiologies were some of the study variables that were examined. Just after emergency had relieved and a review of the health booklet and medical record was finished, information was gathered from the ladies who participated in our research through a structured interview session. Information was analyzed in phases during the course of the study. Researchers initiated the process of observing and gathering different information at every entry of a patient who satisfied the inclusion criteria till the patient were given notice to leave. SPSS (Statistical Package for the Social Sciences) software package 23 was used for data analysis. For each research variable, descriptive statistical analysis was produced. Whenever the distribution is normal, the descriptive quantitative elements are stated as average standard deviation, however when the distribution is non-normal, the descriptive qualitative variables are expressed as number of topics (size) and percentage. To examine frequencies, Fisher's exact tests were applied.

The disparity among comparisons was considered significant for any p value, regardless of its size (number of participants) or percentage. Fisher's exact tests were used to compare frequencies. The discrepancy among comparisons was found important when the p value was less than 0.05. Prior beginning this investigation, we obtained administrative consent from the Minia maternity university hospital administration and the maternity head. Researchers adhered to the norms of anonymity and confidentiality.

Results

The incidence of shock and the average age of the patients ± Hemorrhagic shock status was identified in 51 of these individuals, resulting in a hospital-based incidence of 3.1 percent. The average age of the patients was 27.06. 26.2 percent of the patients were between the ages of 20 and 24 years old.

Shock status prognosis

Mortality: frequency and causes

Five people died out of 51 episodes of hemorrhagic shock, a lethality rate of 9.8 percent. When all causes are included, the percentage of mortality linked with hemorrhagic shock was 38.46 percent (5/13) of the 13 fatalities recorded in the medical ward during the same time period. The delays in referral (3 fatalities) and care provision (2 deaths) were the reasons of mortality.

Factors associated with death

- Patients over the age of 30–34 years (20%) and even those above the age of 35 (35%), had fatalities (33.3 percent).
- Information from the entrance exam:
  Of the patients with a Glasgow score of less than 9, twodied (40%), compared to one fatality (20%) among those with a Glasgow score of greater than or equal to nine. Even after adjusting for other factors, the Glasgow score was significantly

related with death (p=0.028). Coagulatory diseases were treated in the same way.

- Etiology: There was a statistically significant link between a ruptured uterus and patient mortality (p=0.000). Coagulation problems were linked to a higher risk of death in patients (p=0.004).
- Risk factors after adjustment: After adjustment, rupture of the uterus (p= 0.0000), coagulation disorders (p=0.0000), and Glasgow score below 9 (p=0.0285) are the risk factors substantially related with maternal mortality.

Table (1): Level of Consciousness, hemorrhage diagnosis

Characteristic	%
Level of Consciousness	
Normal	58.6
Altered	39.3
Under anesthesia	2.1
Hemorrhage Diagnosis	
Uterine Atony	22.6
Complications of Abortion	3.5
Retained Placenta	4.5
Ectopic Pregnancy	6.8
Abruptio Placenta	8.9
Ruptured Uterus	18.8
Placenta Previa	18.3
Lacerations	9.4
Molar Pregnancy	2.8
Missing	1.4
Placenta Accreta	26.3
MAP<60c	14.4

MAP: mean arterial pressure.

Table (2): Distribution of Vital Sign Values.

Vital Sign	N	Median (IQR)
SI	425	1.3 (1.1–1.5)
Pulse	420	117 (110–122)
Systolic BP	420	90 (80–100)
Diastolic BP	352	59 (50–60)
MAP	352	68.7 (60–73.3)
Pulse Pressure	352	34 (30–40)

SI: shock index; BP: blood pressure; MAP: mean arterial pressure.

Table (3): Distribution of Vital Sign Values.

Vital Sign	N	Median (IQR)
SI	425	1.3 (1.1–1.5)
Pulse	420	117 (110–122)
Systolic BP	420	90 (80–100)
Diastolic BP	352	59 (50–60)
MAP	352	68.7 (60–73.3)
Pulse Pressure	352	34 (30–40)

SI: shock index; BP: blood pressure; MAP: mean arterial pressure.

Table (3): AUC Values of Vital Sign Discrimination Accuracy for Adverse Maternal Outcomes (95 percent Confidence Intervals).

Vital Sign	N	Death	SMO	SMO-CI
SI	425	0.87(0.80–0.94)	0.80(0.73–0.87)	0.76 (0.71–0.81)
Systolic BP	420	0.87(0.80–0.94)	0.77(0.70–0.85)	0.69 (0.64–0.75) ##
Diastolic BP	420	0.81(0.71–0.90)	0.69(0.63–0.74) #	0.69 (0.63–0.75) ##
Pulse	352	0.78(0.69–0.87) #	0.80(0.74–0.86)	0.80 (0.76–0.83)
MAP	352	0.83(0.76–0.91)	0.76(0.68–0.84)	0.70 (0.65–0.76) ##
Pulse Pressure	352	0.39(0.26–0.51) ##	0.51(0.42–0.60) #	0.50 (0.45–0.56) ##

AUC: area beneath the curves; SI: shock index; BP: pulse pressure; MAP: mean arterial pressure; SMO: severe maternal outcome (death or severe end-organ failure maternal morbidity); SMO-CI means for severe outcome or critical intervention, while SMO stands for severe maternal outcome (death or severe end-organ failure maternal morbidity) (intensive care unit hospitalisation, 5-unit blood transfusion, or emergency hysterectomy). The outcomes of the Bonferroni-adjusted chi-square test for AUC equality significance testing, using SI as the reference, are as follows: A significant decline from SI (P0.01). A significant decline from SI (P0.01).

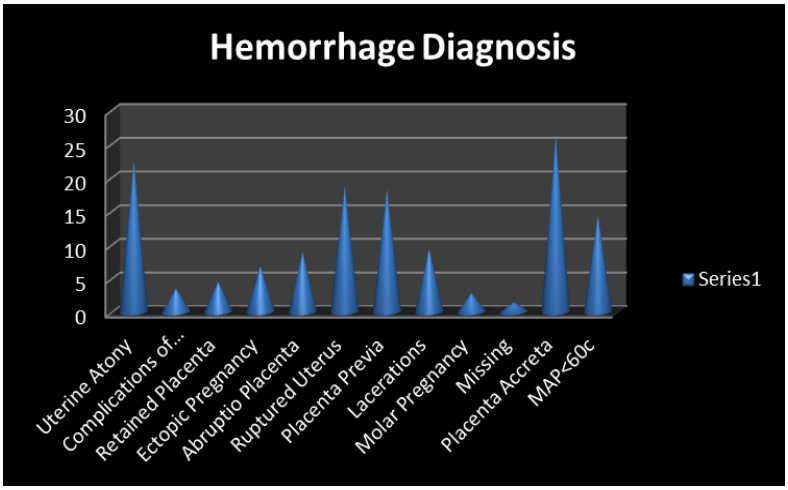

Figure 1: Shock Index on Outcomes ROC Curves: Died SMO and SMO-CI.

Discussion

According to our findings, hemorrhagic shock affects 5.24 percent of patients admitted to the MINIA maternity university hospital, with a fatality rate of 0.98 per 100 childbirths. According to Cohen W, the incidence of hemorrhagic shock in the literature is considered to be 1 percent of pregnancies [7], which is lower than our rate. Other authors have identified greater rates than ours; for example, Harrison KA found 10.1 percent in a Nigerian study [8], and Chattopadhyay SK et al., found 10.2 percent of gynaecological and obstetrical hospitalizations. [9] The fact that the Minia Maternity University Hospital is the major referral hospital in MINIA governorate, and hence the final option for many patients, may explain the increased occurrence of hemorrhagic shock seen in our sample. 51 shock cases resulted in 51 fatalities, yielding a lethality rate of 9.8%. The ratio is larger than what was previously noted by Foumsou L et al., in Chad [10] and Chaoki M. et al., in Tunisia [11] who found that hemorrhagic shock caused 3.7 percent and 1.4 percent, respectively, of fatalities. The high fatality rate can be attributed to a lack of or insufficient patient preparation prior to referral, as well as transportation that is typically not medicalized. The majority of health clinics that refer

patients, for example, lacked an ambulance. The majority of evacuations and referrals were done by taxis, personal automobiles, and motorbikes. In addition, 5 of the 13 patients died from hemorrhagic shock that died in the ward throughout the research period, resulting in a mortality rate of 38.46 percent. This percentage is greater than the 35 percent recorded by Arramdani A in Morocco [12] and the 38.4 percent reported by Traoré B et al., in Mali,[13] respectively. Maternal mortality owing to haemorrhages is estimated to be 19.1% in France [14].

Therefore, obstetrical haemorrhages continue to be one of the top causes of maternal death worldwide, especially in underdeveloped nations. After adjusting for the other covariates, three were shown to be substantially linked to maternal mortality. Examples include uterine rupture, clotting issues, and a Glasgow score of less than 9. Those variables are the result of a combination of circumstances that cause the uterus to weaken and burst huge blood loss till coagulation abnormalities develop, and numerous organ failures, which can lead to altered state of consciousness, among other things. Notwithstanding the fact it did not appear to be more relevant after adjustment in our study, a significant prognostic factor, in the opinion of many doctors, is senior age. However, in our investigation, all mortality instances were found in individuals 30 years of age and beyond. Maternal death risk is linked to age, according to a number of experts. The risk is lowest between both the ages of 20 to 24, and remains to be low until the age of 29, according to Bouvier- Colle et al., as contrasted to a patient group aged 20 to 24, it rises considerably after 35 years, increasing thrice from 35 to 39 years and twelvefold at 45 years. [15] Patients over the age of 35 had a 12.2 times greater risk of mortality from postpartum haemorrhage in the Fenomanana MS cohort in Madagascar throughout 2008 than those between the ages of 18 and 34. [16]

This is because when the patient gets older, new risk factors emerge, such as multiparty. As a result, the risks connected with age and multiparty are accumulated by those women. There were seven fatalities in our cohort. Seven deaths were noted amongst multiparous women regardless of the fact that this factor does not seem to be more significant after correction. Patients with a ruptured uterus had a 55.6 percent mortality rate, whereas those with a coagulation issue had a 75 percent mortality rate. There was a statistically significant link (p=0.000) between hemorrhagic shock mortality and uterine rupture. That rupture is not prevalent among women who have an unscarred uterus, but it is usually complete and severe. Previous uterine surgery, direct or indirect genital trauma, ineffective oxytocin distribution, or large multiparty all can result into uterine rupture. To limit the incidence of death, the treatment approach for uterine rupture is hemorrhagic shock correction and an immediate reaction of surgical homeostasis.

On the other hand, in the lack of quick and simple access to information, swift and coordinated management is a typical reality. It was discovered that hemodynamic state has a high predictive value. Unfortunately, patients frequently come at a point in time when constants have already been significantly changed, indicating a state of severe shock. These patients usually enter in an uncurable state of shock with coagulation issues as a result. This makes resuscitation attempts all but useless. This may be related to ignorance or incompetence in the supervision of recently delivered and bleeding women. For our cohort, patients having unmeasurable blood pressure, and also thread or unmeasurable pulse, had such a high fatality rate. Four of the five deaths were among the ten individuals who had an unmeasurable pulse (80 percent). Hemorrhagic shock and coagulation anomalies also had a statistically significant association (p=0.004). As per Bennani H, the appearance of hemodynamic failure with systolic blood pressure below 60mmhg and the onset of homeostasis abnormalities reduce maternal survival in hemorrhagic shock conditions (Morocco, 2002). [17]

Conclusion

Hemorrhagic shock syndrome is a dangerous and common obstetrical complication in underdeveloped nations. Hemorrhagic shock can strike at any point during pregnancy. The prognosis must be improved by early discovery as well as fast and planned therapy.

Acknowledgments: None.

Conflicts of interest: the author declares there are no conflicts of interest.

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