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Original Research Article

Management of Postpartum Hemorrhages in Sub-Saharan Africa: Epidemiological, Clinical, Therapeutic and Prognostic Aspects

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Abstract: ***Introduction*:** Despite improvements in health, maternal mortality remains a global public health problem. The haemorrhages of the third trimester are still responsible for a heavy mortality. **Objectives:** Contribute to the study of immediate postpartum hemorrhages (PPH) at the maternity department of Nabil Choucair Health Center (NBHC). ***Methodology*:** It was a retrospective descriptive and analytical study on cases of PPH treated between of January 1st, 2011 and December 31th, 2015 at the maternity department of NBHC. We included any patient who was being cared for in the maternity waedfor a PPH. We studied the sociodemographic characteristics of the patients, identified etiological factors and evaluated treatment and prognosis. ***Results*:** The frequency of PPH was 1.1%. The mean age of the patients was 27.5 years. Primiparas (34.3%) and pauciparas (33.3%) were the most affected. The main etiologies of PPH were traumatic lesions (39.6%), uterine atony (31%) and retained placenta (25.2%). Medical management was based on resuscitation using filling fluids, transfusion (22.4%) and administration of oxytocin (51.4%) and prostaglandin analogs associated with oxytocin (48.6%). Obstetrical care consisted of uterine revision and uterine massage (59.8%), uterine revision alone (20.4%) and uterine revision, uterine massage and sandbag placement (19.1%). The mechanical means were mainly represented by intra-vaginal tamponade (69.2%) and intrauterine tamponade (24.4%), including 2 with the balloon. The surgical treatment included 18 hemostasis hysterectomies (13.1%) and 118 (85.5%) restorative sutures. The main maternal complication of PPH was anemia (71%). The lethality related to PPH was 6.8% with 14 deaths including 7 from blood clotting disorders. ***Conclusion*:** The diagnosis and precise estimation of postpartum hemorrhage are the basic elements of the course to be taken. The improvement of his prognosis requires screening for risk factors, early management and availability of blood products. It therefore appears that the management of PPH is essentially based on prevention.

Keywords: Postpartum Hemorrhage, Obstetrical Management, Anemia, Dakar.

INTRODUCTION

Despite health improvements, maternal mortality remains a global public health problem. Indeed, about 830 women die every day worldwide due to complications related to pregnancy or childbirth [1]. There is, however, an important difference between developed and developing countries [2]. According to the World Health Organization (WHO), in 2013, 289 000 women died during pregnancy, childbirth and postpartum [3]. The majority of these deaths occurred in low-income countries. In sub-Saharan Africa, the risk of death during childbirth is 1 on 13, compared to 1 on 4 100 in industrialized countries [4]. Hemorrhages are the leading cause of maternal mortality [5-8]. In Senegal, they represent 31.3% of maternal deaths [9]. It is most often about hemorrhages occurring in the immediate postpartum [6; 10]. The other causes of maternal death are essentially represented by hypertensive disorders, infections, and complications from abortions. These complications are favored by factors such as poverty, illiteracy, lack of hygiene, inaccessibility to care delivery points and/or the lack of equipment for them [1-11]. Immediate postpartum hemorrhages (PPH) represent a significant cause of maternal morbidity with risks related

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to severe anemia, cardiovascular complications, acute renal failure and pituitary necrosis [10].

In developing countries, the management of PPH remains a real challenge. This is due to the lack of adequate equipment, qualified staff and availability of blood products, particularly in level 2 health centers which are supposed to provide emergency obstetric and neonatal care 24 hours a day, 7 days a week. We carried out this work with the aim of evaluating the management of PPH at the maternity ward of the Nabil Choucair Health Center in Dakar, Senegal.

PATIENTS AND METHODS

It was a retrospective, descriptive and analytical study on cases of PPH treated between June 1st, 2011 and December 31th, 2015 at the Nabil Choucair maternity hospital, a period of 60 months. We included in our study any patient who was being treated in the maternity ward for PPH; after childbirth beyond 22 weeks of amenorrhea.

We excluded from our study all patients whose records were inoperative due to a significant amount of missing data, as well as cases of secondary postpartum hemorrhages. For each patient we had studied the following parameters: sociodemographic characteristics, pregnancy history, data at admission (admission mode, admission reasons, clinical data), birth and labor data, neonatal data (Apgar score, birth weight, neonatal outcome), data on PPH (time to diagnosis, initial amount of blood loss, etiologies of PPH, initiated treatment), outcome and prognosis.

RESULTS

During the 5-year study period, we recorded 206 cases of PPH out of 18 188 deliveries performed during the same period, representing a frequency of 1.1%. The average age of the patients was 27.5 years with extremes of 14 and 45 years. The most represented age group was that of patients aged 25 to 29 years in 25.5% of cases, followed by those aged 20-24 years in 21.9% and 30-34 years in 21.4%.

The number of pregnancies was between 1 and 11 with an average of 3. Patients who had between 2 and 3 pregnancies predominated and accounted for 35.9%. The average parity was 2 with extremes of 1 and 9. Primiparas were the most represented in 34.3% followed by pauciparas in 33.3%.

In the majority of cases, 94% of patients, the pregnancy was monofetal and 6% of patients had a multiple pregnancy. The majority of patients, or 98.4% of cases, had their prenatal visits. The average number of prenatal care was 4 with extremes of 0 and 7. More than half of the patients (59.1%) had performed at least 4 prenatal care. During prenatal monitoring, a pathology was found in 28.6% of cases. The main pathologies were hypertensive disorders in 33.9%, fetal macrosomia in 23.7% and twin pregnancy in 18.6%. Pregnancy was full term in 94% of cases. We had 5% of patients who had given birth prematurely. In most cases (82%) the patients had come on their own. We had 12.5% evacuees and 5.5% transfer. More than two-thirds, or 77%, of patients were admitted to work. Only 8% was admitted for PPH and 3% for severe pre-eclampsia. The hemodynamic state was stable in 98% of patients. Only 2% of patients were in a state of hemorrhagic shock at admission. Nearly two-thirds (63.1%) had normal uterine height, 29% had excessive uterine height and 8% had insufficient height. For almost all patients, i.e. 99.5%, the duration of work was not specified. During labor, the most frequently encountered anomaly was hypertensive disorders in 44.1% of cases. The majority of patients, or 91% of cases, had a vaginal birth. Patients who had a cesarean delivery accounted for 9%. The majority of patients (86.7%) had a spontaneous vaginal birth. Among them, 29.1% had undergone an episiotomy and 14.2% a tear of the first or second degree. The cupping was performed in 2% of patients and forceps in 1%. The cesarean section was performed in 8.7% of patients. The indications for cesarean section were in 3.6% severe preeclampsia followed by scar uterus in 3.1%6 and dystocia in 2.8%. Active Management of the Third Stage of Labour (AMTSL) was performed in 81.1% of patients. Artificial delivery was performed in 13.3%. The majority of newborns (81.6%) were well. Resuscitation was necessary in 7.8%. Stillbirths accounted for 6.3% including 8 fresh stillbirths and 5 macerated stillbirths. Apgar score was normal in most cases (81.1%). The average weight was 3002 grams with extremes of 1000 and 4700 grams. The majority of newborns, 82%, had a normal weight. Macrosomes accounted for 4%. The average time to diagnosis of PPH was 132 minutes with extremes of 2 minutes and 1140 minutes. Almost half or 40.4% were diagnosed within 60 minutes. However, 14.1% were diagnosed very late beyond 240 minutes. Blood loss had only been objectively evaluated in 2% of the patients and ranged between 600 and 1200 ml. The most common cause of PPH was represented by traumatic lesions in 39.6% including 14% of cervical tears, 11% of vaginal tears and 7% of vulvoperineal lesions. Traumatic lesions are followed by uterine atony found in 31% of patients and retained placenta in 25.2%. Oxytocin was administered to 51.4% of the patients. In nearly half or 48.6% of the parturients, oxytocin was associated with prostaglandin analogs. The dose of Misoprostol® averaged 689 µg with extremes of 400 and 1000 µg. Blood transfusion was performed in 22.4% of patients. The average of blood bags received was 2.3 with extremes of 1 and 9. The combination of uterine revision and uterine massage was performed in 59.8% of patients followed by a uterine revision alone in 20.4% and the uterine tripod revision, uterine massage and sandbag placement in 19.1%. Intravaginal tamponade was performed in 69.2% of patients followed by intrauterine tamponade in 24.4% of patients, including 2 with the balloon. The intrauterine and intravaginal

tamponade combination was performed in 5.1%. Surgical treatment was performed in 51.9% of the patients. Laparotomy was performed in 10.7% of patients. Among them, 13.1% had an hemostasis hysterectomy. The outcome was favorable in 63.1% of patients. More than a third of the patients, or 36.9%, had presented a complication. Anemia was the one most frequently noted in 71% followed by acute kidney injury and coagulopathy in 5.3% each. We deplored a mortality rate of 6.8% (14 deaths). Blood clots disorders, secondary to uterine atony, and acute kidney injury were the causes of death. The factors of poor prognosis found after analytical study are: young age, multiple pregnancies, vaginal delivery, poor prenatal care, late referrals or evacuations and cesarean section.

DISCUSSION

We have collected 206 cases of PPH out of a total number of 18,188 births, representing a frequency of 1.1%. The frequencies reported in the African literature are variable: 0.19% by Pambou [12], in Congo and 0.86% by Nana [13], in Dakar. These rates contrast with those of Seck in Thies [14], and Guindo in Mali [15], which were respectively 2.66% and 2.63%. This difference in frequency would probably be due to the diversity of diagnostic criteria. These criteria are clinical and biological. Indeed according to the French National College of Gynecologists and Obstetricians (CNGOF): whatever the way of childbirth, PPH is defined as a blood loss 500 ml after childbirth and severe PPH as a blood loss 1000 ml. In our context, the diagnosis of PPH is most often made through a visual estimation of blood loss or during a state of hemorrhagic shock. It is therefore subjective and it is therefore likely that many PPH will not be diagnosed. The average age of our patients was 27.5 years with extremes of 14 and 45 years. The most represented age group was 25-29 years (25.5%). Guindo [15], in Mali found in his study a mean age of 25.7 years with extremes of 15 and 45 years. Seck in Thies [14], found a mean age of 30 with extremes of 15 and 50 years. Fall [16], in his work found in Bordeaux an average age of 30 years with extremes from 16 to 42 years.

The most represented age group was 25-34 years. Overall, we find that the average age of African women is lower than that of French women. This is probably explained by the precocity of marriages in Africa, which means that at 30 years old, they are oftenpPauciparous or multiparous. The average parity was 2 with extremes of 1 and 9. In the study by fall [16], in Bordeaux, it was 0.85 with extremes of 1 and 5. In our study, primiparas and pauciparas predominated with 34.3% and 33.3%, respectively. The difference between the average parity and the extremes in our series and that of fall would be partly related to the pronatalist attitude and the earlier marriage in Africa. The prevalence of primiparous and pauciparous is related to the frequency of pathological risk factors in this group. These risk factors are dominated by vascular-renal syndromes and their complications, of which primiparity represents an etiological factor. More than half of the patients (59.1%) had performed at least 4 prenatal visits. Even if the prenatal visits allow identifying the risk factors for PPH, the best strategy remains the availability of Emergency Obstetric and Neonatal Care thanks to the presence of qualified staff in maternity hospitals 24 hours a day with adequate technical support. At delivery, the majority of patients (94%) were full-term. Our results are close to those of fall [16], in Bordeaux. In his study, pregnancy was carried to term in 88.5% of cases and in 9.8% of cases it was premature births. The majority of patients (82%) had come on their own for the management of their childbirth. Only 18% of patients were evacuated or referred. Wiam [17], reports a rate of 44% of patients evacuated or referred. In the series of Traore [18], 63.93% of patients were evacuated from other localities in the district of Bamako. This shows that in our study, most of the PPH occurred at the Nabil Choucair Center which is a reference structure. The analysis shows that retained placenta was more frequent in patients who had come on their own. The hemodynamic state was stable in 98% of patients. Only 2% of patients were in a state of shock. Seck [14], had a rate of patients admitted in shock of 14.4%, Wiam [17]. 18.5% and Nana [13]. 19.2%. The low rate of patients who were admitted to shock is due to the fact that the majority of patients (94.9%) had given birth at the Reference Center. Artificial induction of labour was achieved in 6 (3.4%) patients. This rate is high compared to that of Seck [14], which was 0.8%, and low compared to those of Wiam [17], and fall [16], which were respectively 9.8% and 22.9%. In our series, we did not find a statistically significant relationship between the realization of an artificial onset of labor and the different causes of PPH. The instrumental extractions concerned 3.1% of patients. They are described as risk factors for immediate postpartum hemorrhage [19, 20]. Descargues [19], observed that patients with undiagnosed haemorrhage at delivery had significantly higher rates of forceps than patients with diagnosed PPH. It incriminates the cervico-vaginal tears related to these instrumental extractions. The active management of the third phase of childbirth is part of the means of prevention of PPH [21]. It was performed in 81.1% of patients. It should be noted that the type of issuance was not specified in 4.1% of cases. The examination of the placenta was only done in 3.4% of the patients. Active Management of the Third Stage of Labour (AMTSL) is one of the low-cost and effective interventions that could prevent PPH in thousands of women worldwide each year [22]. Retroplacental hematoma was found as a risk factor for PPH during labor in 25.6% of patients. We had listed a total of 206 newborns with 13 stillbirths (6.3%) including 8 fresh stillbirths and 5 macerated stillbirths. Wiam [17], in Dakar found 24.5% of stillbirths and Keita [23], in Bamako 12.32%. Dead egg retention is incriminated in clotting disorders occurring during delivery, by passage of thromboplastins into the general circulation of the parturient. This high rate can also be explained by the high proportion of pathologies occurring during labor such as the recurrent hematoma,

the placenta praevia and uterine rupture. The number of neonates was 8 (4%). Wiam [17], in Dakar finds a rate of 9.4% of macrosomes and fall [16], in Bordeaux a rate of 6.6%. A birth weight greater than 4000 g and a twin delivery are classically described as risk factors for PPH through uterine overexpansion [20]. Pregnancy was twins in 6% of the pregnant women. The percentage of uterine atony was higher in patients with multiple pregnancy. The main causes of PPH were traumatic lesions (39.6%), followed by uterine atony (31%), partial retained placenta (25.2%) and blood clot disorders (4.1%). Our results join the data from the literature [12-27], regarding uterine atony which is the first cause of PPH. The rate of retained placenta in our work is considerable (25.2%). According to Pambou [12], it is classic to encounter retained placentas in patients with an history of uterine trauma or uterine perforation. This could not be verified in our study because of the lack of reporting on patient histories in many medical records. Retained placenta could also be due to a failure to respect the physiology of deliverance. The retraining of nursing staff and the regulation of the medical profession in our developing countries are essential aspects in the prevention of PPH. Uterine rupture engages the maternal and fetal vital prognosis as well as the subsequent functional prognosis of the uterus. In our study, 6 cases of uterine rupture were listed, ie 2% of the etiologies PPH. Aflak [28], and Ducloy [29], report a rate similar to ours, according to them, uterine ruptures would be responsible for 2% of immediate postpartum hemorrhages. Cervical-vaginal and perineal tears were 101, or 32.3% of the etiologies of PPH. These lesions can be prevented by the practice of an episiotomy quickly followed by a correct perineorrhaphy and the systematization of the exploration of the cervico-vaginal pathway through a subvalved examination in front of any PPH. In our study, 13 cases of coagulopathy were found, representing a rate of 4.1% of the causes. In Bordeaux, Fall [16], had no case of coagulopathy. These coagulopathy problems could be linked in our study to in-utero deaths (6 cases), retroplacental hematomas (2 cases), the rate of patient transfers to our maternity ward (18%) and caesarean section. This hypothesis is corroborated by the percentage of bleeding disorders that was higher in referred or evacuated patients. The percentage of blood clots disorders was higher in patients who had a cesarean delivery. The success of PPH treatment depends on its early onset and quality of care. The average time to diagnose the hemorrhage was 132 minutes and the diagnosis was based on visual estimation of bleeding. The initial amount of losses was only specified in 4 patients and the average was 82 5ml. It is urgent to propose plastic bags or a graduated container for collecting blood loss in our maternity hospitals in order to reduce the diagnostic time and thus allow a rapid, accurate and appropriate intervention. The treatment of PPH must be ensured by a multidisciplinary team comprising in addition a midwife, an obstetrician, a resuscitator, a biologist and a radiologist. Almost all women had received crystalloids as an infusion. The quantities of the perfused liquids were not mentioned in the records. Blood transfusion was performed in 44 (22.4%) patients. The average of transfused pockets was 2,3 with limits from 1 to 9. The recommendations of the French Society of Anesthesia and Resuscitation on vascular filling during hypovolemia recommend the use of crystalloids when blood loss is estimated at less than 20% of the blood mass and the use of colloids are recommended immediately for a patent hemorrhagic shock with estimated loss greater than 20% of the blood mass or if the average arterial pressure is immediately below 70 mmHg. Oxytocin accounted for 51.4% of drug treatment. This molecule is recommended as a first-line dose of 5 to 10 IU for slow intravenous administration. Maintenance treatment is then initiated using an infusion at a rate of 5 to 10 IU per hour for two hours [30]. Prostaglandin analogs accounted for 48.6% of drug treatment. They were associated with oxytocin. The average administered dose was 689 µg. Prostaglandins are not recommended as a first-line treatment for PPH [31]. It is recommended to administer, within 15 to 30 minutes after the onset of hemorrhage, a treatment with sulprostone as an intravenous infusion to the electric syringe. The intramuscular and intramyometric routes are contraindicated. We start with a dosage between 100 and 500 micrograms per hour. According to the recommendations established in France [30], it is not recommended to use misoprostol intrarectal in the treatment of immediate postpartum hemorrhage. However, Shojai [31], demonstrated the effectiveness of misoprostol in the therapeutic management of immediate postpartum hemorrhages by uterine atony. Misoprostol should benefit from prospective studies because its ease of administration, low cost and storage facilities make it an interesting product for developing countries that are most exposed to hemorrhages in the immediate postpartum period [32]. The combination of uterine revision and uterine massage accounted for 59.8% of obstetrical treatment, the uterine revision alone 20.4% and the tripod combining uterine revision, uterine massage and sandbag 19.1%. Wiam [17], reported a rate of 58.7% for the tripod and 25% for the combination of uterine revision and uterine massage. Artificial deliverance was not practiced as obstetrical treatment in our series. Fall [16], found in France a rate of artificial delivery at 49% and uterine revision at 73.8%. If the delivery has not taken place, it is imperative to perform an artificial delivery under general anesthesia or epidural to obtain the uterine vacuity and if it has already taken place, the uterine revision is required, even if the delivery seems complete [33]. The performance of endo-uterine procedures must systematically be followed by broad-spectrum antibioprophylaxis due to the risks of secondary endometritis [29-33]. The intra-vaginal tamponade accounted for 69.2% of the mechanical means implemented, intrauterine tamponade 24.4%, intrauterine and intravaginal tamponade combination 5.1%, and intrauterine tamponade and bimanual uterus compression 1.3%. In our regions, with limited resources, access to devices such as the Bakri probe or

the Blackmore one is difficult but the advent of the balloon using a condom has revolutionized the management of immediate post-partum due to uterine atony by their effectiveness and their cost which is very accessible in our hospitals. The place of arterial embolisation is no longer to be demonstrated in the management of severe PPH [34, 35]. This technique allows the stopping of bleeding in more than 95% of cases by controlling coagulopathy frequently associated with PPH. It can also be attempted in case of an anomaly in placental insertion (placenta accreta or percreta) since the surgical sanction is most often hysterectomy [35]. Immediate PPH is a common and worrying problem that sometimes requires hysterectomy, thus depriving women of any subsequent possibility of motherhood. We recorded in our study 18 cases of hemostasis hysterectomy, which is 13.1% of surgical treatments and 8.7% of the total number of PPH. In the works of Pambou [12], 14.58% of patients had an hemostasis hysterectomy with 3 cases of death. Hysterectomy is generally indicated after failure of embolization, vascular ligations or uterine plications, but it can be performed immediately if the situation requires it. In countries like ours, it often comes after the failure of uterotonics and the intrauterine balloon. It will be preferentially subtotal. This technique is simpler, faster and as effective as total hysterectomy outside of specific situations. The uterine padding and uterine suture were performed each in 2 (1.4%) patients. Despite the many advances made in patient management, PPH remain a serious obstetric condition for the mother, due to the unpredictability of their occurrence and the complications that can result. We recorded 14 deaths, or 18.4% of the complications. Bleeding disorders were the most common cause in 50% of deaths. The lethality was 6.8%. This rate is significantly lower than those observed in the other series: 39.5% for Pambou [12], in Congo Brazzaville; 33% according to Nana [13], in Dakar and 25.6% for Traore [18] in Mali. It is higher than those of Wiam (1.1%) [17], in Dakar, Fenomanana (1.4%) [26], in Madagascar and Fall (1.6%) [16], in Bordeaux. These high rates in certain African series could be explained by the late diagnosis of PPH, the long delay and the quality of care characterized by the lack of resuscitation resources, the absence of emergency supplies and blood products in maternity hospitals. The percentage of blood clot disorders was higher in patients who had a cesarean delivery or for clotting disorders the percentage of deaths was 50%. This is in accordance with the results of Bouvier-colle [6], who finds in his study that half of deaths result directly from the cesarean section. As other complications, 54 patients had anemia, or 71% of the complications, 5.3% had acute kidney injury, and 5.3% had coagulopathy. Hemostasis hysterectomy was performed in 13.1% of patients. Wiam [17], found a rate of 46.7% of anemia, 9.8% of disseminated intravascular coagulation, 8.7% of acute kidney injury and 6.5% of hemostasis hysterectomy. These results show that anemia is the most common complication of PPH. Its prevention involves iron supplementation during pregnancy and rapid and adequate management in case of PPH. Hemostasis hysterectomy can be avoided in many cases by the acquisition of an adequate technical platform and an interventional radiology room. Artificial delivery should be performed when the placenta is not expelled within 30 minutes. It is necessary to monitor the parturient in the birthing room for two hours following the delivery. This monitoring focuses on the extent of blood loss, the quality of the uterine globe, heart rate and blood pressure measurement. This data will be recorded in the patient's medical record. Early diagnosis is an essential element of the prognosis for any PPH. Quantification can be facilitated by the placement of a buttock collection bag after fetal expulsion to assess blood loss. In the case of a caesarean, blood loss is greater than in a vaginal delivery and estimating this loss is particularly difficult. It is recommended to perform directed delivery rather than performing immediate manual delivery [30].

CONCLUSION

The diagnosis and precise estimation of postpartum haemorrhage constitute the basic elements of the action to be taken. The improvement of his prognosis requires screening for risk factors, early management and availability of blood products. It therefore appears that the management of postpartum haemorrhage is essentially based on prevention.

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