Obstet Gynecol Res 2020; 3 (4): 242-250 DOI: 10.26502/ogr046

Research Article

Evaluation of Hellp Syndrome Management

Zelmat SA[1*], Bouabida D[2], Bellalaoui I[3], Zaoui C[4], Boucherite E[3], Mazour F[5]

[1]Lecturer A in intensive care anesthesia, EHU d´Oran, Oran, Algeria

[2]Department of Pediatrics, EHU d´Oran, Oran, Algeria

[2]Department of Obstetrics and Gynecology, EHU d´Oran, Oran, Algeria

[4]Faculty of Medicine, EHU d´Oran, Oran, Algeria

[5]Resuscitation anesthesia specialty, EHU d´Oran, Oran, Algeria

[*]**Corresponding Author:** Zelmat Setti Aouicha, Lecturer A in intensive care anesthesia, EHU d´Oran, Resuscitation anesthesia specialty, Oran, Algeria, E-mail: settiaouichazelmat@yahoo.fr

Received: 23 April 2020; **Accepted:** 05 May 2020; **Published:** 20 November 2020

Citation: Zelmat SA, Bouabida D, Bellalaoui I, Zaoui C, Boucherite E, Mazour F. Evaluation of Hellp Syndrome Management. Obstetrics and Gynecology Research 3 (2020): 242-250.

Abstract

Inroduction: HS (hemolysis, elevated liver enzymes, low platelet count) is an obstetric emergency with significant maternofetal morbidity and mortality. Its diagnosis is difficult, sometimes in a hyperacute manner in the form of a multi-visceral failure syndrome. The prognosis of this pathology depends on the quality of care. Fifty present of HS-related deaths are due to delayed diagnosis and management. According to the formalized recommendations of common experts in 2009 SFAR / ICNGOF / SFMP / SFNN the improvement of HS care mainly concerns the information and training of the nursing staff and the patient and the organization of networked care. For this reason, a research was conducted in the ORAN EHUO gynéco-obstetrics department for patients with HS whose objective is to evaluate the effect of an intervention aimed at improving the human factor. Complications, maternal mortality, time to care, length of stay and patient satisfaction, and describe the factors associated with death in the HS.

Material: The study was conducted at the gynecological obstetrics department in two phases. A retrospective study during the period from January 2014 to the end of 2015 was performed on patients hospitalized for HS including clinical, biological, socio-epidemiological characteristics, complications, delays and duration of hospitalization , maternal deaths and

perinatal, and patient satisfaction; then an intervention on the human factor was implemented gradually and continuously from January 2016 to the end of 2017. The evaluation of the intervention was done through the before-after study method.

Result: The analysis of the data concluded that there were 165 cases of HS, a frequency which increased significantly between the two phases from 0.35% in the first phase to 1.5% in the second phase. Maternal deaths had significantly decreased from 15.7% to 3.14% between the two phases (P = 0.01) and none of the patients had eclampsia postoperatively (2.6% vs. versus). The per and post op blood pressure imbalance increased from 78% to 7.1% with a (P ≤10-3). The laparotomy for hemorrhage increased from 15.7 to 1.6%. After intervention on the human factor, perinatal mortality decreased from 31.5% to 16.5%. The duration of maternal hospitalization between delivery and discharge decreased between the two phases of 18 days and 45 hours in the first phase at 10 days and 7 hours (p <10-3) Regarding the satisfaction went from 34.4% to 74, 3%. All maternal deaths were class I as well as a low socioeconomic status, resulting from a late transfer. Complications associated with death include DIC (80%), eclampsia (70%), PAO (50%), hemorrhagic shock (30%), hepatic hemorrhage, and encephalopathy (10%).

Conclusion: The results of the research highlight the positive impact of the human factor namely reduction of maternal mortality, intraoperative complications and duration of hospitalization, satisfaction of the patient. This allows us to conclude that the role of the human factor in improving the care of the HS is unavoidable.

Keywords: Maternal Mortality; HS; Obstetric Emergency; Human Factor; Improved Care

1. Introduction

Described a quarter of a century ago by Weinstein [1, 2] from 29 observations of associated pre-eclampsia (PE); hemolysis (H for hemolysis), hepatic cytolysis (EL for elevation of liver enzymes), thrombocytopenia (LP for low platelet count). These combined observations made it possible to define a suggestive and catchy acronym [3], Hellp Syndrome (HS). This syndrome is characterized by a symptomatic, progressive and etiological polymorphism [4].

The Mississippi classification makes it possible to distinguish 3 classes of Hellp, [5, 6]; Class 1: the most serious, with: a platelet count less than or equal to 50, 000 / ml. ASAT or ALAT ≥70 IU / L. LDH ≥ 600 IU / L. Class 2: Platelet count between 500, 000 / ml and 100, 000 / ml. ASAT or ALAT ≥70 IU / L. LDH ≥ 600 IU /. Class 3: a rate between 100, 000 / ml and 150, 000 / ml, ASAT or ALAT ≥ 70 IU / L. LDH ≥ 600 IU / L. Hellp syndrome remains a public health problem in Algeria, this syndrome is supported by a heavy maternal morbidity and mortality, all the more severe since the diagnosis is made late [7, 8]. Among these complications; eclampsia, retro placental hematoma, renal failure, subcapsular hematoma of the liver and acute edema of the lung, a syndrome of multi visceral failure.

Maternal mortality reaches 24%, perinatal mortality can go up to 60%. More than half of these deaths could be avoided, with an early diagnosis and an adequate multidisciplinary cost; which requires rigor and vigilance on the part of healthcare personnel involving the human factor and the organization of healthcare. The aim of this work is to improve the price charged for HS by acting on the human factors of the organization of care.

2. Equipment

2.1 Type of study

This is a descriptive, monocentric comparative study of maternal-fetal morbidity and mortality linked to the Hellp Syndrome between two periods; before and after the introduction of a protocol aimed at improving the practice of nursing staff in the management charge of the (HS), carried out at the obstetrics and gyneco service of the Oran EHU. The study was carried out in two periods:

- First retrospective, which was the subject of a preliminary study (N = 38 patients), during the period from "January 2015" to "December 2016". During this period, all the files of patients with hellp syndrome were studied.
- Then prospective (N = 127 patients) from "January 2017" to "December 2018" by a protocol applied continuously (see the intervention protocol on the human factor). During this period all patients with Hellp Syndrome have been studied.

2.2 Eligibility criteria

2.2.1 Inclusion criteria: Any parturient admitted to the gyneco-obstetrics department of the Oran EHU, either by evacuation from another establishment, or a consultation presenting a (HS). The diagnostic criteria for HS used in our study are those stated by the classification of Mississippi class 2 and 3.

2.2.2 Exclusion criteria: Mississippi class 3. (Patients with HS class 3, are excluded from the study because they have a very low morbidity or even rare mortality). Thrombocytopenia due to another cause (congenital, thrombocytopenic purpura, Hemolytic uremic syndrome, fatty liver). A rise in ASAT and LDH due to another cause.

2.3 Description of the human factors intervention protocol

2.3.1 Purpose of the protocol:

- Early care. Multidisciplinary care.
- Codified medical treatment.

2.3.2 Protocol development: The development of an HS treatment protocol that is accessible in high-risk pregnancy units, in the operating room and in the post-intervention care room.

2.3.3. Line-up: The operation of this intervention concerned personnel made up of:

Medical staff: Resuscitating doctors (assistant master and specialists), obstetrician gynecologists; (lecturers, assistant teachers and specialists), pediatricians, nephrologists, internists, gastrologist, general practitioners, residents, internal and external in medicine.

Para medical staff: Midwives, nurses, technical anesthetists, childcare worker, psychologist, pharmacy manager, maternity coordinator.

2.3.4. Human factor intervention:

The nursing staff:

- at. Staff redeployment: Resuscitation anesthesia residents are divided between the post-interventional care room and the high-risk pregnancy unit, the operating room and at the reception room level.
- Staff awareness: The sensitization of the nursing staff concerned the degree of severity of this Syndrome, the importance of the speed of the biological results, the interest of the availability of blood derivatives in emergency and the strict monitoring of the patients during transfers.

- vs. Staff training: The training of nursing staff focused on multidisciplinary and early management, the need for teamwork, and favored the orientation system after childbirth and stabilization. This practical hospital supervision concerned residents, interns, externs, and all paramedical staff, and was applied through seminars, staffs, daily medical visits. d. Information for patients and those around them with more communication and listening.

The organization of care: at. Organization of an adapted close monitoring structure: b. Installation of the emergency kit: It is set up in the post-interventional care room, and in the reception room in obstetric emergencies. The composition of the emergency obstetric kit is structured as follows: Drugs: adrenaline, corticosteroids, atropine, diazepam, intubation tray, intubation tray Materials: catheters, transfusor, urinary catheter, oxytocin, sterile compress box, adhesive plaster.

2.4 Definition of the human factor

2.4.1 Human factors fall into two categories: Human factors linked to individuals (attitudes, states of mind, values of project actors); those linked to relationships between individuals (exchanges, interactions between project actors [7-8]. (Interactions between project actors). The measurement of the human factor is subjective, for this we acted on the human factor by the aforementioned protocol, then we measured the impact of the improvement in the practice of care personnel on fetal maternal morbimortality and the length of hospital stay.

2.5 Factors studied

We first describe the characteristics of the overall population, including all the patients included in the study from "2013 to 2016", then we compared the two populations on the following factors:

2.5.1 Maternelle maternal lethality: The number of cases of HS who died out of the number of women with HS during the study period.

2.5.2 Maternelle HS maternal mortality: It is the number of deaths with HS over the number of live births during the same study period.

2.5.3 Intra intrauterine fetal mortality: It is the death in utero of fetuses occurring between 22 weeks of gestation and before any start of labor.

2.5.4 PrécoceEarly neonatal mortality: It is the mortality of children between birth and the end of the 7th day of life (mortality occurring during the first week of life).

2.5.5 Pér Perinatal mortality: It is the sum of early neonatal mortality and intrauterine fetal mortality.

2.5.6 Maternelle Perioperative maternal complications: All the complications that occur before, after and after surgery.

- The length of hospital stay.

2.6 Statistical study

The data were coded and entered using SPSS software version 21.0. A descriptive analysis using the calculation of percentages for qualitative variables and means for quantitative variables, was performed, followed by a bivariate analysis with Chi-square and Pearson correlation tests r. The significance threshold was set at $p = 0.05$.

3. Results

In total, a sample of 165 parturients admitted for (HS);

of which 121 patients are evacuated from maternity wards of other peripheral wilayas. The average age in our patients is 32 ± 6.33, [extremes between 19 and 45], with a median of 32. We notice a predominance of multiparity in 45% of the cases, with an average parity of 2 ± 1 children. Clinical signs were present in 159 patients (96.3%). these signs are mainly represented by epigastric pain 68% of cases, vomiting in 67%, headache in 50% of cases, mucocutaneous jaundice in 32.7% of cases, oliguria in 32.1% of cases, edema of the Lower limbs in 73.3% of patients, dehydration in 21.2%, ascites in 16.4% of cases, and bruising in 9.7% of our patients. As for the impact of improving the practice of care personnel; We compared the two populations before and after the application of the protocol, with regard to general, clinical and biological parameters (see Table 1). In the light of the different results, we can establish that the two populations are comparable.

Maternal lethality decreased statistically significantly (p = 0.01). Ranging from 6 deaths in 38 cases (15.6%) in the first period to 4 deaths in 127 cases of (HS), (3.14%). during the second period. The HS maternal mortality rate decreased between the two periods from 6 deaths out of 10, 660 live births, or 0.56 ‰ in the first period to 4 deaths out of 9, 623 live births, in the second period, or 0.41 ‰. There was no significant difference in maternal morbidity before and after application of the protocol (see Table 2). As for intraoperative complications. After application of the protocol, there were no cases of postpartum eclampsia (2.6% / versus 0 after). We observed a marked improvement in hemodynamics with a P ≤10-3, and the use of laparotomy after postpartum hemorrhage decreased from "15.7% to 1.6%" with a (p = 10-3), as did the rupture of the subcapsular hematoma of the liver slightly decreased (see Table 3). Neonatal mortality decreased from 36.8% to 7.1% significantly (p <10-3.). There is no significant difference in intrauterine fetal mortality (see Table 4). The average length of hospital stay is 12 ± 5.12, the length of maternal hospital stay between delivery and discharge decreased statistically significantly (p <10-3) from 19 days to 10 days.

		AVANT (38)	APRES (127)	P
variable		Moyenne	Moyenne	
Age		32, 82	32, 47	0, 22
		6, 71	6, 24	
Parité		3 ± 2	3 ± 2	=
Formes du HS	complet	47, 4	35, 4	1, 18
	incomplet	52, 6	64, 6	
Classes du HS	Classe I	55, 3	50, 4	0, 59
	Classe II	44, 7	49, 6	
Types	Pré partum	92, 1	78, 7	0, 06
du HS	Post partum	7, 9	21, 3	

Table 1: Study of the comparability of the two populations with regard to the general parameters.

	Before (38)		After (127)		
	Nbr de cas	%	Nbr de	%	P
Pre-partum eclampsia	9	23, 68	29	22, 83	0, 91
Acute Lung Edema	3	7, 9	7	5, 51	0, 87
Sub-Capsular Hematoma of the Liver	3	7, 9	8	6, 3	0, 98
Hrp Retro Placentary Hematoma	5	13, 15	15	11, 81	0, 95
Disseminated Intra Vascular Coagulation	5	13, 15	12	9, 44	0, 72
Encephalopathy	1	2, 63	2	1, 57	0, 79
Renal Failure	13	34, 2	50	39, 4	0, 69

Table 2: comparison of maternal complications.

	1ère période (N=38)		2ème période (N=127)		
Sub-Capsular Hematoma of the Liver	Nombre de cas	%	Nombre de cas	%	P
Laparotomy after postpartum hemorrhage	6	15, 7	2	1, 6	0, 001
Failure of an	3	7, 9	2	1, 6	0, 14
Perioperative tension imbalance	30	78, 9	9	7, 1	<0, 0001

Table 3: Comparison between the two periods of maternal perioperative complications.

	AVANT (38)		APRES (127)		
	Nombre de cas	%	Nombre de cas	%	P
Neonatal mortality	14	36, 8	9	7, 1	<0, 0001
in utero mortality	10	26, 3	33	26, 0	0, 86
périnatale mortality	12	31, 5	21	16, 5	0, 07
new born alive	14	36, 8	85	66, 9	0, 001

Table 4: Comparison of in utero, neonatal, and perinatal mortality between the two.

4. Discussion

The results thus obtained could be compared with those of the literature dealing with the improvement of the practices of the nursing staff, where tests and studies have multiplied in recent years. Our study is particularly characterized by a decrease in mortality, maternal lethality and neonatal mortality between the two periods, while maternal morbidity has not changed. Thus, in the study by Menzies et al, who found a reduction in maternal risk significantly but the neonatal outcome did not change, [8]. The study by Mbola et al, found a significant decrease in mortality, lethality of maternal morbidity and neonatal mortality between the two periods (p> 10-6) [9]. Maternal mortality: In our series, the mortality rate was significantly lower (3.14%) after the initiation of the treatment protocol. Several similar results have been reported in the literature. Thus, in the study by Weinstein [10] this rate

was 3.5% [10], 5.8% in the study by Benletaifa [12] and 4% in the study by Manouni [13] (see Table 5).

4.1 Maternal morbidity

In our series Despite the improvement in the practice of nursing staff, there was no change in complications of (HS) between the two periods, this is attributed to the late diagnosis of HS, because most of these patients are transferred to the stage of complications.

4.2 Intraoperative maternal complications

In our series after application of the protocol, the use of laparotomy after postpartum hemorrhage was significantly lower at 1.6%. In the literature, we find several similar studies. Thus, in the study of Sibai et al, The use of laparotomy was 2% [11], and 1.8% in the study of vitalis et al [9]. This result is probably due to the real existence of the involvement of all care staff.

4.3 Perinatal mortality, Neonatal mortality

In the literature, we find several studies [6, 15], where we note fluctuations in perinatal mortality between 17 to 60%, And substantially identical to those recorded in our series (31.5%, 16.5%). In our series, neonatal mortality was significantly lower after application of the protocol, we find several similar studies, including the perinatal mortality rate ranges from 6 to 37% [1, 2, 17, 18]. This variation in mortalities between the two periods can have several explanations:

- Lack of information and awareness on the management of hellp syndrome
- The lack of visibility of the real existence of the practice of neonatal resuscitation
- The lack of involvement of the paramedical staff (childcare worker, nursing assistant) in monitoring the newborn in the neonatal unit.

4.4 Intra utero fetal mortality

Our study is particularly characterized by an intra uterine fetal mortality of 26%. More superior to the figures reported in the study by Sibai et al, which was 19% [11], and closer to the study by Manouni et al, which was 31% [8]. This difference could be explained by the late transfer of patients, whose diagnosis of (HS) was made at the stage of intrauterine fetal death, and the absence of prenatal follow-up.

4.5 Duration of hospitalization

Our study is particularly characterized by a duration of hospitalization during the first period, far superior to the figures reported in the literature. In the Hanibilal study, for example, the average length of hospital stay was 10.35 days [14], and Vitalis 6.17 days [15]. These results are close to the results of the second period. This is probably due to the patient referral system proposed in the protocol.

Authors	country	year	Number of patients	Maternel death (%)
Weinstein [10]	Amérique	1985	57	3.5
Sibai [11]	Amérique	1993	442	1, 1
Benletaifa [12]	Tunis	2000	17	5, 8
Mamouni[13]	Maghreb	2012	61	4
Hani bilal [14]	Algérie	2016	25	8
Our study after the protocol application	Algérie	2016	127	3, 14

Table 5: Frequency of maternal mortality according to the authors.

4.6 Limit of the study

Our study has a number of limitations. Indeed, we encountered difficulties in collecting data retrospectively which can present an information bias.

5. Conclusion

This study highlighted the benefits of human factors in improving the management of HS, these factors include awareness, continuing education of caregivers, patient information and organization of care. This study demonstrated the reliability of appropriate and multidisciplinary early management, the gain of which was marked by the reduction in maternal and perinatal mortality, the reduction in intraoperative complications. And the reduction of the stay at the gyneco-obstetric service. This should probably have an impact on the cost of patient care. The line of work to improve this care must be centered on human factors and meet objectives such as developing neonatal resuscitation, Worked so that the management of obstetric emergencies is consensual and multidisciplinary.

Conflict of Interest

No conflict of interest

References

1. Pottecher T, Luton D, Zupan V, et al. Multidisciplinary management of severe forms of preeclampsia. RFE SFAR / CNGOF / SFMP / SFNN (2010).
2. Medhioub K F, Chaari A , Turki O, et al. Up-to-date on the HELLP syndrome (Hemolysis, Elevated Liver enzymes and Low Platelets). rev med interne 37 (2016): 406-411.
3. Weinstein L. Syndrome of hemolysis, elevated liver enzymes, and low platelet count: a severe consequence of hypertension. Am J Obstet Gynecol 142 (1982): 159-167.
4. Pourrat O, Pierre F, Magnin G. The HELLP syndrome: the ten commandments. Journal of Internal Medicine 30 (2009): 58-64.
5. Carles G. (HS)/Clinical forms and alternative etiologies. Obstetrics (2009).
6. Martin JN Jr, Rose CH, Briery CM. Understanding and managing HELLP syndrome: the integral role of aggressive glucocorticoids for mother and child. Am J Obstet Gynecol 195 (2006): 914-934.
7. OMS. Why is consideration of human factors important for patient safety?. Multi-professional edition WHO Patient Safety Teaching Guide (2001).
8. Ramain E, Carlès M, Brigato K, et al. Disorganization of the operating room: the role of human factors. Mapar (2004): 583.
9. Mbola mbassi S. Soins obstétricaux d'urgence et mortalité maternelle dans les maternités de troisième niveau du Cameroun : approche évaluative d'une intervention visant améliorer le transfert obstétrical et la prise en charge des complications maternelles. Gynecology and obstetrics. University Pierre and Marie Curie - Paris VI (2014).
10. Weinsteïn L. Preeclampsia/eclampsia with Hemolysis, Elevated Liver Enzymes, and Thrombocytopenia. ObstetGynecol 66 (1985): 657-660.
11. Sibai BM, Ramadan MK, Usta I, et al. Maternal morbidity and mortality in 442 pregnancies with hemolysis elevated liver enzymes and low platelets (HELLP syndrome). Am J Obstet Gynecol 169 (1993): 1000-1006.
12. Ben Letaifa D, Ben Hamada S, Salem N, et al. Maternal-fetal morbidity and mortality associated with Hellp syndrome. Ann Fr Anesth Reanim 19 (2000): 712-718.

13. Mamouni N, Bougern H, Derkaoui A, et al. HS: about 61 cases and review of the literature. Pan African Medical Journal 11 (2012): 30.
14. HANI Bilal M AS. HELLP syndrome; thesis 2016 Abderrahmane Mira Béjaia University.
15. Vitalis Cavaignac Marie. Le traitement conservateur du HELLP syndrome est-il acceptable ? étude rétrospective comparative multicentrique à propos de 118 patientes. Thèse d'exercice en Thèses > Médecine spécialisée, Université Toulouse III - Paul Sabatier (2013).
16. Boudhaa k, jelouli M, Gara M F. le HS: A propos de 17 cas et revue de la littérature. La Tunisie médicale 88 (2010): 497-500.
17. Sibai BM, Ramadan MK, Chari RS, et al. Pregnancies complicated by HS (hemolysis, elevated liver enzymes, and low platelets): subsequent pregnancy outcome and long term prognosis. Am J Obstet Gynecol 172 (1995): 125-129.
18. Sibai BM, Mercer B, Sarinoglu C. Severe preeclampsia in the second trimester: recurrence risk and long-term prognosis. Am J ObstetGynecol 165 (1991): 1408-1412.