



# Traumatic Impact of Mothers Who Experienced a Severe Postpartum Hemorrhage

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## Abstract

**Objective:** There is no strong evidence concerning the traumatic effect of severe Postpartum Hemorrhage (PPH) on mothers and the bond with their newborns.

We investigated the impact of PPH on mothers and newborns with a mixed prospective study. Patients who experienced severe postpartum hemorrhage >2000 ml were compared to a Control Group (CG). Women from both groups underwent an interview and answered a revised Horowitz scale event questionnaire during the postnatal period. Post-Traumatic Stress Disorder (PTSD) mean scores were compared using the Paired Wilcoxon Signed rank test. Fisher's exact test was used for count data. Quantitative and qualitative analyses of the semi-directive interviews were performed.

**Results:** Thirty patients were evaluated (15 in each group). The mean PTSD scores were  $23.7 \pm 14.8$  in the PPH group and  $1.7 \pm 1.4$  in the CG ( $p < 0.001$ ). All patients in the PPH group expressed a fear of dying versus no patients in the CG ( $p < 0.0001$ ). The relationship between the mother and child was disharmonious and complicated in 10 of 15 (66%) patients in the PPH group versus 0 in the CG ( $p = 0.0002$ ).

**Conclusion:** Patients who experienced a severe post-partum hemorrhage presented a major and significant post-traumatic stress disorder compared to control group. A fear of death was found in all patients of PPH group. A significant disharmonious relationship between the mother and her newborn is found in the PPH group when compared to control group.

**Keywords:** Postpartum hemorrhage; Post-traumatic stress disorder; Fear of dying

## Abbreviations

PPH: Postpartum Hemorrhage; PTSD: Post-Traumatic Stress Disorder; ESR: Event Scale Revised

## Introduction

Postpartum hemorrhage is among the leading causes of maternal mortality [1]. Many efforts have been introduced to reduce morbidity and mortality, including uterine conservative treatments [2,3]. Severe Postpartum Hemorrhage (PPH) defined as blood loss superior to 2,000 ml [4] remains an extremely grave event. However, few studies have investigated the traumatic impact of severe hemorrhage on the mother and her newborn [5-9]. Some authors found a fear of dying, or depression following a PPH [7]. However, van Stralen et al. [10] reported a good quality of life after emergency embolization for PPH. There is no robust evidence concerning the traumatic impact of PPH on the mother and her newborn [9,11].

Thus, we aimed to investigate the traumatic impact of severe PPH on mothers and newborns, specifically on the bond between them and how mothers experienced this major event.

## Methods

Women who experienced severe PPH and women of a control group answered a revised Horowitz scale event questionnaire [12,13] and semi-directive interviews (see supplementary

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material).

This descriptive study was conducted in the Maternity Department of the Regional Hospital Center of Orleans between January 1<sup>st</sup>, 2011 and December 31<sup>st</sup>, 2013. All consecutive patients who had severe PPH with more than 2 liters of blood loss were compared to patients in a Control Group (CG) who delivered by the same mode during the same month but without PPH. Patients from the PPH group underwent conservative treatments to stop PPH. Patients who underwent a hysterectomy for PPH or with psychiatric disorders were excluded from this study.

Previous obstetrical and general characteristics of the patients were obtained anonymously from their charts. An anonymous number was attributed to each patient.

The interviews and PTSD scores were determined 3 to 6 months after delivery to allow for some time after the event.

After informed consent of the patient, the interviews were conducted by telephone after the Post-Traumatic Stress Disorder (PTSD) scale assessment because it was difficult for some patients to return to the place of the traumatic event (avoidance behavior).

The semi-directive interview included five thematic questions and lasted approximately one hour (Annex 1).

They addressed the general characteristics of the woman and her familial and obstetrics history, the history of her last pregnancy, her experience of the birth and PPH, her feelings about the management of the PPH and her relationship with her child.

At the end of each interview, an appointment was proposed with the psychologist if necessary.

After the interview, we proposed the revised Horowitz scale to the women in both groups. We used the validated French version of the Event Scale Revised (R-IES) [9].

The Horowitz scale [10] was composed of 15 questions. The IES revised [11] is composed of 22 items divided into three subscales that allow them to distinguish between avoidance symptoms (8 items), intrusion symptoms (7 items) and neurovegetative hyper reactivity symptoms (7 items). For each item, the patient had to indicate the frequency on a Likert scale of 5 points (from 0 (not at all) to 4 (extremely)). The total scores were obtained by adding the score of each question.

According to the PTSD scale, the results can be divided into three categories [14-16]:

Subjects with scores between 1 and 11 presented little symptoms of post-traumatic stress

Subjects with scores between 12 and 32 presented numerous symptoms of post-traumatic stress;

Subjects with scores higher than 33 presented with a very high number of PTSD symptoms.

This study was approved by the Institutional Review Board of Ile de France II, Ref. 2011 09 15.

### Statistical analysis

Continuous data were described by the mean, standard deviation, and boxplot graphics. Regarding the sample size and main outcome variable type, the mean PTSD score in each group was compared

using the Paired Wilcoxon Signed rank test. For comparisons of proportions, we used Fisher's exact test for count data. The significance level is set to 0.05 for all tests. We performed a quantitative and qualitative analysis of the semi-directive interview [16].

All interviews were transcribed in French and then translated into English. Thematic analysis was used to code and analyze the data. SA and NR initially read all interviews several times and coded the interviews after identifying main themes and subthemes. Key themes were obtained after several discussions and consensus of co-authors. Notes from debriefing were recorded.

The software used for computing statistics was Logiciel R version 3.1.2.

## Results

Thirty patients were included in this study (15 in the PPH group and 15 in the control group). There were no significant baseline differences between the PPH group and the control group concerning parity, ethnicity, age and mode of delivery; the only difference was blood loss volume (Table 1).

The mean PTSD score in the PPH group was  $23.7 \pm 14.8$  vs.  $1.7 \pm 1.4$  in the group control. The mean PTSD score was significantly higher in patients with postpartum hemorrhage than in the control group ( $p < 0.001$ ) (Table 2).

The patients in the hemorrhage group displayed major psychological traumatism compared to the control group who delivered in the same conditions.

Eleven out of 15 patients presented a PTSD score greater than 11 (73.3%). They should be followed and/or receive psychological care.

Three out of 15 patients (20%) presented scores greater than 40. They require immediate care.

### Analysis of interviews

N x is the anonymous number of the patient's answer from the PPH group.

We identified 6 themes (Table 3):

**Fear of death:** All patients in the PPH group expressed the fear of death whereas no patients of the control group reported this fear ( $p < 0.0001$ ). Fear of death was increased by the perception of the

**Table 1:** Baseline characteristics of the PPH group versus the control group.

	PPH group	Control group	P value*
N	15	15	
Mean age $\pm$ Sd (years)	$34 \pm 4$	$34 \pm 5$	0.86
Blood loss (cc)	>2000	<400	
Mean parity $\pm$ Sd	$2 \pm 1$	$2 \pm 1$	0.8.
<b>Origins</b>			<b>0.92</b>
French	8	8	
Sub-Saharan African	4	4	
Maghreb/Other	3	3	
<b>Mode of delivery</b>			<b>1</b>
Caesarean section	11	11	
Vaginal delivery	4	4	

\*p value was computed using the Wilcoxon rank sum test for age and parity, Fisher's test for origins, and the Chi-square test for mode of delivery  
PPH: Postpartum Hemorrhage

**Table 2:** PTSD scores of the PPH group versus the control group.

	Min.	1 <sup>st</sup> Qu.	Median	Mean	3 <sup>rd</sup> Qu.	Max.	Sd
PPH group (n=15)	7.00	12.50	19.00	<b>23.73</b>	30.00	60.00	14.8
Control group (n=15)	0.000	0.500	2.000	<b>1.733</b>	3.000	4.00	1.44
Wilcoxon signed rank test p-value				<b>p=0.0007</b>			

Qu: Quartile; Min: Minimum; Max: Maximum; Sd: Standard deviation  
data: Hemo and ctrl

V=120, p-value =0.0007211

We used the Wilcoxon signed rank test with continuity correction.

The alternative hypothesis is the following: true location shift is not equal to 0

**Table 3:** Perception of mothers in the PPH group versus the control group.

	PPH group	Control group	p value
<b>N patients</b>	15	15	
<b>Insecure links between the mother and her parents</b>	4	0	0,099
<b>Negative perception of relationship with health professionals in the delivery room</b>	8	3	0,129
<b>Negative relationship in the maternity unit</b>	8	4	0,26
<b>Disharmonious and complicated mother-infant bond</b>	10	0	0.0002
<b>Fear of death</b>	15	0	<0.0001

P values are computed with Fisher's exact test for count data

Sd: Standard deviation

team's behavior in the context of the emergency.

**N 11:** "I was very scared, very scared; I fell asleep, during the general anesthesia, in a great anxiety, I was afraid to leave them, not to see them again".

**The relationship between the mother and her child** was disharmonious and complicated in 10 of 15 (66%) patients in the PPH group versus 0 of 15 in the control group (p=0.0002).

The patients in the bleeding group described a loss of connection with the newborn. Separation during PPH management creates a catch-up overinvestment of the child-mother bond.

**N15:** "My daughter.... She was not with me for 2 days, she cries easily. I'm very close to her, it's impossible to be separated... except when she sleeps."

**N10:** "After a week in intensive care unit without seeing them, I need time to become their mother. I am very dependent of my children; I appreciate every moment of life with them."

**Insecure bond with family:** An insecure bond between the patients and their mother and family was reported by 4 out of 15 patients in the PPH group (27%) compared to zero in the control group. This lack of relationship with family seems to increase post-traumatic stress. Indeed, higher PTSD scores were reported when the link to the family was insecure.

Conversely, a good relationship with the mother seems to reduce the trauma:

**N14:** "For a moment, I was a little sad, fortunately my mother was there, she consoled me, and did the work for me."

However, there was no statistically significant difference concerning the insecure link with the family between the PPH group and the control group.

**Perception of a state of panic in the delivery room or the theatre:** The patients in the PPH group described the brutality of the hemorrhage and the rapid reactions of the teams in this emergency

situation:

**N15:** "I saw the midwife lift the blanket, she panicked, and she told my husband to go out ... in 10 min I lost a lot of blood".

**Insufficient communication and lack of explanation** was perceived by 8 of 15 patients in the PPH group (53%) vs. 3/15 (20%) in the control group.

**N14:** "A doctor said I was losing a lot of blood, and I had to go to the theatre. I did not understand... I wanted more explanation, I did not want to go to the theatre, I was panicked."

A lack of explanation in accessible terms was sometimes reported. However, there were no statistically significant differences compared to the control group concerning the communication between health professionals and patients.

**Needs and care in the maternity unit:** After the hemorrhage was resolved and stopped in the maternity unit, 8 of 15 women (53%) in the PPH group versus 4 of 15 (26%) in the control group reported that their primary needs were not satisfied. However, these differences were not statistically significant.

The patients said that they were too tired, required more explanations on breastfeeding, and required help taking care of the newborns so that the mother could recover.

**N15:** "In the morning, I was advised to return back home too early; they did not see that I was still too tired."

## Discussion

In our study, we found a significant presence of post-traumatic stress disorder in patients who experienced severe postpartum hemorrhage compared to the control group. Most patients of the PPH group required psychological care and long-term follow-up. The IES-R used in our study [14] showed strong internal consistency for the intrusion factor, the avoidance factor and for hyperactivity. Similar results were found in the study by Creamer et al. [17] in which the IES-R was compared to the PTSD Checklist.

Caroll et al. [18], reported post-traumatic stress in women

who experienced PPH. Modarres et al. [6] identified PTSD in 80% of women who experienced a traumatic delivery. It is important to diagnose PTSD in women who experience severe PPH because it may negatively affect their life and their new pregnancies [19-22].

In our study, the fear of death was reported by all patients who experienced severe PPH but was not found in patients in the control group. It is increased by the perception of a state of panic of some health professionals, the brutality of the PPH, the presence of numerous health professionals and their behaviors when facing the emergency in the delivery room. Sentilhes et al. [7] also reported a fear of dying after PPH treated by embolization.

Approximately half of the patients reported inadequate communication with health professionals in the PPH group. They claimed a lack of explanation during the management of PPH.

Nevertheless, many patients thought that health professionals were busy managing the sudden bleeding. The experience of a traumatic effect is increased when the perception of communication is insufficient. The quality of communication enhances the confidence toward health professionals.

According to Dunning et al. [23], over half of the women who experience PPH desire more communication.

The mother-to-child relationship was significantly disharmonious and complicated in most patients in the PPH group; Mothers in the PPH group had difficulty decoding the needs of the baby when he/she cries or does not sleep.

Early separation of the mother and infant because of the management of PPH had a negative impact on the relationship between the mother and infant. Bystrova et al. [24] reported a negative impact on the relationship between the mother and infant one year after an early separation.

In the maternity unit, some patients of the PPH group expressed a lack of consideration of primary needs such as being too tired, sleeping without the newborn, or wanting more counselling about breastfeeding. de Visser et al. [25] also reported extreme fatigue in 81% of women experiencing major PPH.

## Study Limitations

The study population is not too large because of the rarity of severe hemorrhagic events and difficulty to approach these patients for research objectives. However, this study with a control group and the semi-directive interviews is a pilot study and will include many other maternity centers. The results are significant and will influence the management and follow-up of patients who experience severe PPH.

## Conclusion

Patients who experienced severe postpartum hemorrhage presented major significant post-traumatic stress disorder compared to the control group. A fear of death was found in all patients in the PPH group. A significant disharmonious relationship between the mother and her newborn was demonstrated in the PPH group compared to the control group.

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