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Trends of maternal mortality by hemorrhage, avoidable tragedy? Maternity "Concepción Palacios" 1939-2020

Tendencias de la mortalidad materna por hemorragia, ¿tragedia evitable? Maternidad "Concepción Palacios" 1939-2020

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SUMMARY

A descriptive, retrospective, and analytical study were carried out, a documentary research type, under a mixed paradigm to analyze the historical evolution of maternal mortality (MM) due to obstetric hemorrhage in the "Concepción Palacios" Maternity. The population and the sample consisted of all the pregnant women who died due to obstetric hemorrhage during pregnancy, childbirth, or the puerperium, from January 1939 until the end of December 2020. The objectives were to know the frequency of deaths due to obstetric hemorrhage by administrative periods, to calculate the maternal mortality ratio (MMR), and to know the factors that influenced its decrease. The results report that there were 2,705 maternal deaths (MD) per 1 698 969 live newborns for a global MMR of 159.21 x 100 000 LB. 531 MD were recorded due to obstetric hemorrhage, with an MMR of 31.25 x 100000 LB, representing 19.62 % of MM, with a gradual decrease associated with advances in diagnosis and treatment, although limited by the social aspects associated. It is concluded that among the keys to reducing MM due to obstetric hemorrhage are education in sexual and reproductive health, education and training of health personnel in maternal-fetal medicine and critical obstetrics, analysis by theoretical premises that allow identifying the social aspects of MM and the health care reality related to its management and implementation of preventive public policies.

Keywords: *Obstetric hemorrhage, maternal mortality, maternal death.*

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RESUMEN

Se realizó un estudio descriptivo, retrospectivo y analítico, tipo investigación documental, bajo paradigma mixto con la finalidad de analizar la evolución histórica de la mortalidad materna por hemorragia obstétrica en la Maternidad "Concepción Palacios". La población y la muestra estuvo constituida por todas las gestantes que fallecieron en el embarazo, parto o puerperio, desde que se puso en funcionamiento la maternidad en enero de 1939 hasta diciembre de 2020, se incluyeron todas las muertes maternas por hemorragia obstétrica que fallecieron durante el período 1939-2020. Los objetivos fueron conocer la frecuencia de las muertes por hemorragia obstétrica por períodos administrativos, calcular la razón de mortalidad materna (MMR) y conocer los factores que influenciaron la disminución de las misma. Los resultados reportan que hubo 2 705 muertes maternas (MM), con 1 698 969 recién nacidos vivos para una MMR global de 159,21 x 100 000 LB, se registraron 531 MM por hemorragia con una MMR por hemorragia obstétrica de 31,25 x 100 000 LB, representando el 19,62 % de la MM, con un descenso paulatino asociado a avances en diagnóstico y tratamiento, aunque limitado por los aspectos sociales relacionados con la MM. Se concluye que entre las claves para disminuir la MM por hemorragia obstétrica están la educación en salud sexual y reproductiva, la formación y entrenamiento de personal de salud en medicina materno fetal y obstetricia crítica, el análisis por premisas teóricas que permitan identificar los aspectos sociales de la MM y la realidad sanitaria relacionada con su manejo e implementar políticas públicas preventivas.

Palabras clave: *Hemorragia obstétrica, mortalidad materna, muerte materna.*

INTRODUCTION

Obstetric hemorrhage is an important maternal and perinatal morbidity/mortality cause worldwide. It was considered avoidable or preventable up to 70 % - 90 % of the cases in environments with available resources and qualified staff to provide a protocolled, timely, early, progressive, and organized quality care by the health team that includes the use of multimodal therapy with accessibility to blood products (1,2). The incidence of medical emergencies associated with hemorrhage has increased with the risk of maternal mortality (MM), due to a series of changes in the maternal demography, related to the rise of assisted reproduction technologies and the deferral of gestations by personal option or change of paternity, added to the presence of aggravating factors such as the increase of obstetric high-risk gestations as well as the gestations in extreme ages, increase of nulliparous women, the presence of comorbidities such as obesity, chronic hypertension, cardiovascular, renal, pulmonary and neurologic diseases (3).

The World Health Organization (WHO) along with other prestigious organizations, published relevant statistics related to this subject (4). In 2017, 295 000 MD were recorded worldwide, with a global maternal mortality rate (MMR) in 2017 of 211 MD (IC: 99 to 243) by 100 000 live births (LB), which represents a reduction of 38 % since 2000, year in which the MMR was calculated as 342 by 100,000 LB. In 2015, the MMR was 239 by 100 000 LB in developing countries while in developed countries it was 12 by 100 000 LB (5). It has been calculated that the global average risk for MM for a 15-year-old pregnant girl in 2017 was 1 in 190; almost half the risk level in the year 2000 that was 1 in 100. During 2000, 2005, 2010, 2015, and 2017 years, the punctual estimations for MMR were 119,113, 115, and 125 by 100 000 LB, respectively, with a total change of – 5 %, while globally the estimations decreased by 38 % (4).

Among the Sustainable Development Goals (*SDG*) (6), presented for the agenda in period 2016 - 2030 by the United Nations (UN), there is the SDG 3: Ensure healthy lives and promote well-being for all at all ages. Goal 3.1 of the SDG: from the present time until 2030, it is needed to reduce globally the MMR to less than 70 by 100,000 LB. The fifth Millennium Development Goal (5MDG) established for the year 2000, determined that the MMR should be decreased to 75 % between 1990 and 2015 (7). For the year 2015, the MMR was 239 by 100 000 LB in developing countries, while in developed countries it is 12 by 100 000 LB. The highest estimated risk for MM through life is 1 in 4 900 in developed countries compared to 1 in 54 in undeveloped countries (5,8).

Among the main causes for obstetric hemorrhage, there are abortion, premature abruption of a normoinserted placenta (PANIP),

placenta previa, uterine rupture, trauma, coagulopathy, and postpartum hemorrhage (PPH). The PPH, caused in 80 % of the cases by uterine atony, affects 1 of 20 labors worldwide, representing most of the MD by obstetric hemorrhage in developed countries. PPH is being considered as preventable with the appropriate obstetric support, consisting of no delays in providing health care, as the first hour is vital in terms of prognosis with the activation of the so-called "Red Code" (8,9). The hemorrhage represents the second cause of death in America and the first one globally, representing one-quarter of the MD, by extrapolation of the global RMD for 2017, and an approximate global MMR by obstetric hemorrhage of 50 by 100 000 LB (4). Over 50 % of the deaths occur during the 24 hours postpartum (10).

The Venezuelan state has shown preoccupation when performing multiple meetings, agreements, declaration of principles, and even the proposal of goals regarding the reduction of the MM that has yet to be reached, or the numbers are too far from the planned goals to solve this problem that violates the rights of women to have maternity under optimum health, emotional and physical conditions that generate safety and welfare for her and the newborn (11).

On the other side, the analysis of the MM by theoretical premises, changing the positivist paradigm for a constructivist one, born from the hermeneutical comprehension of the historic study of the direct and indirect medical causes such as the hemorrhage, has been proposed by Cabrera (12), as a derivation of the work by Karolinski et al. (13), who proposed a model to address the MM, establishing the prioritization and knowledge of the problem that is referred to its definition, causes and consequences, while involving the characterization that implies the territoriality, social and political context.

The methodological extent means the analysis of the results through the triangulation of the quantitative information with the qualitative information. The management of the knowledge, which implies gathering the information of the problem for making decisions and then, the formulation of articulations with the investigation policies. The innovation generates new tools for addressing the new problems and finally its implementation (12).

Therefore, starting from the proposition of Cabrera and Uzcátegui (11), the analysis of the historic evolution of the MM by theoretical premises allows the planning of strategies of public policies which respond to the need of prevention, diagnosis, and early management of the EMM by hemorrhage, meriting the timely training of the health personnel in the areas of obstetrics and fetal-maternal medicine in the attention of obstetric emergencies in association with hemorrhage. Such reflection is very relevant in a moment in which the third level health care centers have difficulties (because of infrastructure, availability of supplies – drug and blood products or insufficient personnel training/experience) providing quality attention in the cases of EMM by hemorrhage, with the subsequent MD, as in the "Concepción Palacios" Maternity (CPM).

Cabrera (12) determined that the 2018 MMR in the CPM was 218.25 by 100 000 LB through the extrapolation of the data of his work (although it does not explicitly determine MMR related to hemorrhage) and calculated that it was 54.56 by 100 000 LB for that year. Cabrera et al. (14), report that 23 % is associated with hemorrhage. To have an idea of the repercussion of such numbers in terms of MM by obstetric hemorrhage according to the reports by country and publication of basic indicators of the Pan – American Health Organization (PAHO) (15,16), in the United States of America 2018, the biggest economy of the world, the estimated MMR was 14 for 100 000 LB (15), with a percentage of MD by hemorrhage of 11.3 % (16), for an estimated MMR by hemorrhage of 1.58 by 100 000 LB.

This study was performed to analyze the historic evolution of the MM by obstetric hemorrhage in the CPM by theoretical premises; determine the MMR by obstetric hemorrhage in relation to the administrative periods, the associated aspects to the MMR by hemorrhage, and the formulation of guidelines to improve the MMR by hemorrhage.

MATERIAL AND METHODS

This was a descriptive, retrospective, and analytical study of documental investigation type,

framed on the mixed paradigm (quantitative and qualitative). The population and the sample were constituted by all the pregnant women who died during the pregnancy, labor or postpartum, during the period from January 1939 to December 2020. All maternal deaths by hemorrhage in relation to pregnancy, labor, and postpartum were included, without any omission. For the recollection of the data the instrument of the medical file was used, which is considered as a storage unit under a format or scheme that can be a database or a file, amongst others. The documents of the historical repertory of the Distrito Capital government and those of the nation were reviewed and registered to correlate the historic events with the maternal deaths. A secondary source, the National Level for the Sentinel Surveillance of maternal and infant mortality, which was established by the Health Ministry in 2006, was also consulted.

This source of information is available at the Epidemiology Unit of the CPM. Therefore, for the recollection of the pertinent to the investigation data, the medical records, and the surveillance systems for MM (SIVIGILA) were used. (17) For the execution of this investigation, the files of the Epidemiology Unit of the CPM, SIVIGILA MMI, and SIVIGILA MM2 were requested, maintaining confidentiality, with regards to the data recorded in the file of epidemiology surveillance of maternal death. All the quantitative information was registered annually, in a database with Excel version 2019 for Windows; a resume was made in statistic tables of distribution of absolute and relative frequencies and the MMR. The qualitative information was registered in files.

The absolute and relative frequencies of the nominal variables were calculated, likewise, the MMR was estimated as the rate of the maternal deaths to live birth by 100 000 LB; the MMR by obstetric hemorrhage was calculated as the rate of the number of deaths by obstetric hemorrhage to live birth by 100 000 LB and the direct obstetric MMR (DOMMR) as the ratio of the number of deaths because of direct obstetric causes by 100 000 LB. The trends in the differences of the global MMR and the MMR by obstetric hemorrhage in each administrative period were made with the chi-square test. The results are presented in statistic tables of the chronological series type, expressed in absolute and relative numbers through the rate. In the analysis we calculated the variations, the logarithmic trend curves were constructed for the data of MMR, MMR by obstetric hemorrhage, and obstetric hemorrhage as the cause of MM according to a linear regression model where the explicative variable, related to time, was standardized in ordinal, not numerical terms, so each year was assumed as a fixed value, and from that model, the changes in MMR were estimated by obstetric hemorrhage, as a cause of MD. A statistically significant contrast value was considered if $P< 0.05$. The tables and the analysis of the data were performed with RStudio version 1.1.456 (18-20).

RESULTS

Until December 2020, there were in the CPM 2 705 maternal deaths, from which 1 857 were DOMM, with 1 698 969 live births for an MMR of 159.21 x 100 000 LB, in relation to a worldwide MMR by direct obstetric causes of 109.30 x 100 000 RLB. 531 MD by hemorrhage were registered with an MMR by hemorrhage of 31.25 x 100 000 LB, representing 19.62 % of the MM and 28.60 % of the DOMM. In the first year of the considered interval for this study, 1939, the MMR was 736.84 x 100 000 LB, the MMROD was 596.49 and the MMR by obstetric hemorrhage was 140.35 x 100 000 LB. In the last year of the assessed interval, 2020, the MMR was 103.44 x 100 000 LB, the DOMMR 103.44 x 100 000 LB, and the MMR by obstetric hemorrhage 14.78 x 100 000 LB.

The higher quantity of maternal deaths in the CPM is found during the administrative period of 1969-1974 with 335, while the smaller one is found during the administrative period of 1993-1994 with 26, with an arithmetic mean of 122.95 ± 94.2. The higher quantity of maternal deaths by hemorrhage was evidenced between 1969-1974 with 75, while the smallest is in the administrative periods 1993-1994 and 1999-2001 with 2 each, with an arithmetic mean of 24.13 ± 18.12.

Regarding the live births, the higher quantity is registered between the years 1969-1974 with 227 135 and the smaller one in 1948 with 9 229, and an arithmetic mean of 77 217 ± 65 317.

Concerning the MMR, the highest value was in the administrative period of 1939-1941 with

684.80 x 100 000 LB, while the smallest was between the years 1999-2001 with 81.33 x 100 000 LB, with an arithmetic mean of 214.25 ± 145.6.

For the MMR by obstetric hemorrhage, the highest incidence was during the administrative period of 1939-1941 with 203.59 x 100 000 LB, while the smallest was between the years 1999-2001 with 5.61 x 100 000 LB, with an arithmetic mean of 49.83 ± 49.68.

With regards to obstetric hemorrhage as a MM cause, the highest incidence was in the administrative period of 1948-1950 with 38.80 %, while the smaller one was between the years 1999-2001 with 6.90 %, and an arithmetic mean of 20.42 ± 8.38.

The trends of the distribution of maternal death, the maternal deaths by obstetric hemorrhage, and live birth can be observed in function of the administrative periods as delimiting the public policies in relation with the MM (Table 1).

The diversity regarding the administrative periods related to the dynamic politics of the country, and the evolution of the MM by hemorrhage through time in association with the factors that influence the sanitary policies of the governments can be observed in Table 2, Figures 1 and 2, although there are ascending dynamic changes between the periods between 1948 and 1958, and from the administrative period, 2001-2002 to 2013-2020, the general linear trend established since 1939 is descending.

Table 1

Maternal Death by Obstetric Hemorrhage and Live Births by Administrative Periods. "Concepción Palacios" Maternity 1939-2020

ADMINISTRATIVE PERIOD	Maternal Deaths (n)	Maternal Deaths by obstetric hemorrhage (n)	Live Birth (n)
1939-1941	74	22	10 806
1941-1945	124	35	22 550
1945-1948	46	14	16 033
1948-1948	33	7	9 229
1948-1950	67	26	20 704
1950-1952	56	15	28 636
1953-1958	147	48	98 482
1958-1958	38	8	22 050
1959-1964	205	43	166 221
1964-1969	236	48	194 360
1969-1974	335	75	227 135
1974-1979	258	38	159 496
1979-1984	296	39	148 905
1984-1989	187	26	123 887
1989-1993	177	22	102 651
1993-1994	26	2	15 791
1994-1999	92	7	90 964
1999-2001	29	2	35 653
2001-2002	27	5	15 301
2002-2007	121	21	70 296
2007-2013	52	14	56 954
2013-2020	82	14	62 665
Total	2 705	531	1 698 969

Table 2

Maternal Mortality Rate by Obstetric Hemorrhage as Maternal Mortality caused by Administrative Periods.
"Concepción Palacios" Maternity
1939-2020

ADMINISTRATIVE PERIOD	MMR (x 100 000 LB)	MMR by obstetric hemorrhage (x 100 000 LB)	Obstetric hemorrhage as Maternal Mortality cause (%)
1939-1941	684.80	203.59	29.72
1941-1945	549.88	155.21	28.22
1945-1948	286.90	87.32	30.43
1948-1948	357.57	75.84	21.20
1948-1950	323.60	125.57	38.80
1950-1952	195.55	52.38	26.78
1953-1958	149.26	48.73	32.64
1958-1958	172.34	36.28	21.05
1959-1964	123.32	25.87	20.98
1964-1969	121.42	24.70	20.34
1969-1974	147.48	33.02	22.39
1974-1979	161.75	23.82	14.73
1979-1984	198.78	26.19	13.18
1984-1989	150.94	20.99	13.91
1989-1993	172.42	21.43	12.43
1993-1994	164.65	12.67	7.7
1994-1999	101.13	7.70	7.61
1999-2001	81.33	5.61	6.90
2001-2002	176.45	32.68	19.12
2002-2007	172.90	29.87	17.28
2007-2013	91.30	24.58	26.89
2013-2020	130.85	22.34	17.07

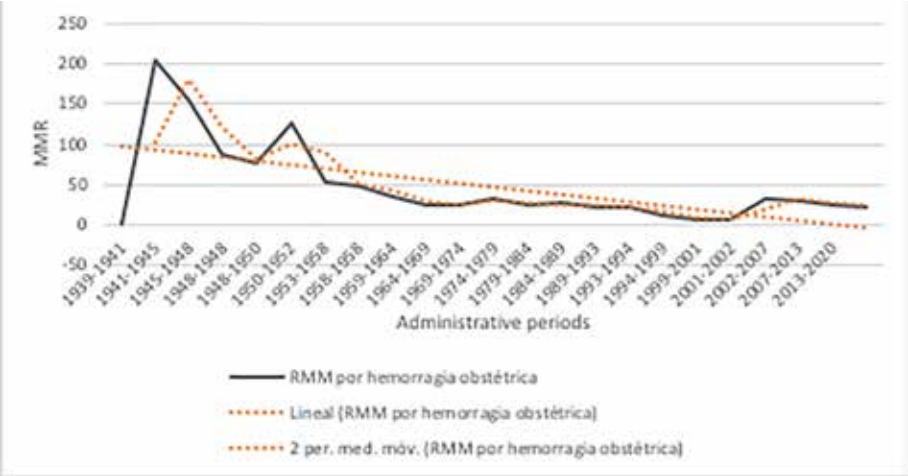

Figure 1 . Maternal Mortality Rate by obstetric hemorrhage by administrative period. "Concepción Palacios" Maternity.

Figure 2. Obstetric hemorrhage as a maternal mortality cause by administrative period.

DISCUSSION

According to the SDG of the 2000-2015 period, Venezuela should have reduced the MMR from 53.10 to 13.3 x 100 000 LB and reduce the infant mortality from 25.80 to 8.78 deaths x 1 000 LB (21-23). Unfortunately, it was not only impossible to achieve this goal, but according to the estimations of the WHO for 2017, the MMR was 125 x 100 000 LB, with a percentage change of -5 %, opposite to the global reduction of MM of -38 % (4). Such numbers on decline regarding the MM, are in agreement with the situation observed in a study in a third level center for maternal care, such as the CPM, in which during the last administrative period 2013-2020 resalted there was an increase in the MMR of 130.85 x 100 000 LB compared to the administrative period of 1999-2001 in which the MMR was of 81.33 x 100 000 LB.

For being in agreement with the SDG of the UN for the period of 2016-2030, in which the MMR of the country shall decrease to less than 70 x 100 000 LB, it is imperative to reduce MM by obstetric hemorrhage, the second cause of MM in America and the second cause of historic MM in the CPM (10,12), a center considered as a national reference regarding maternal care during a great part of the administrative periods since its opening, in which this study was performed. In this sense, several State strategies had been deployed, the immediate Contraceptive Plan post obstetric event was implemented in collaboration with the PAHO/WHO, the endouterine manual aspiration (EUMA), and the "Zero Maternal Deaths by Hemorrhage" initiative (24,25).

The initiatives to mitigate the impact of the obstetric hemorrhage in the EMM and the MM of the Obstetrics and Gynecology Society of Venezuela are highlighted. These have encouraged the training course "Advance Life Support in Obstetrics" (ALSO®) promoting the training of professionals linked to the practice of obstetrics using teaching models through the simulation, promoting teamwork and effective communication in obstetric emergencies (26).

In such a context, unfortunately, the MMR by obstetric hemorrhage in the CPM had an increase of approximately 4 folds for the 2013-2020 period, with 22.34 x 100 000 LB compared to the 1999-2001 administrative period with a registered MMR by obstetric hemorrhage of 5.61 x 1 000 LB.

The evidence of an increase in the MMR by obstetric hemorrhage for the last administrative period considered for this investigation represents an institutional setback of the public policies in the administrative periods of the last 20 years, on the contrary, the descending linear trend historically observed since the opening of the

institution in 1939, where it was only observed an increase of MMR by obstetric hemorrhage in the 1948-1958 administrative periods. The MMR by obstetric hemorrhage of the 2013-2020 administrative period represents less than half of the approximation of MMR by obstetric hemorrhage of 50 by 100 000 LB for the 2017 year globally, according to the WHO data (4).

The MMR by obstetric hemorrhage in the 1939-2020 period in the CPM of 31.25 x 100 000 LB is much smaller compared to the global estimation for 2017 (4). More than half of the MM by obstetric hemorrhage, as well as other causes, is produced in fragile environments and the context of humanitarian crisis (27). The risk of death related to maternity by all causes is 1 in 4 900 in developed countries and 1 in 180 in developing countries, which represent 99 % of the global MM. In the countries classified as fragile states, it is 1 by 54, which demonstrates the consequences of the decomposition of the health systems.

In comparison with the data of Latin America and the Caribbean, where there is an annual reduction of MM in 3 % (5), with a regional MMR of 67.2 x 100 000 LB for 2019 (15), with one of five maternal deaths caused by obstetric hemorrhage (28), it is calculated from such numbers an approximated MMR by hemorrhage of 13.67 x 100 000 LB. The MMR by obstetric hemorrhage in the CPM for the most recent administrative period 2013-2020 is approximately a proportion of 2:1 regarding the regional MMR by obstetric hemorrhage.

There are countries in the region such as Chile, Uruguay, and Costa Rica where the MMR is less than 25 x 100 000 LB. There is to note that the numbers of MMR by obstetric hemorrhage in the CPM during the most recent administrative period of 2013-2020, are pale in comparison with the data of the studies of other health care centers in other Latin American capitals like Bogotá (29), where the obstetric hemorrhage represented a 13 % in the 2010-2015 administrative period for the MMR of 35.71 x 100 000 LB for an MMR by obstetric hemorrhage of 4.64 x 100 000 LB. The MMR by obstetric hemorrhage in the CPM for the 2013-2020 administrative period represented almost 5 times that valor. However, the statistic is similar to those reported in Peru where for 2017 the MMR was 70 x 100,000 LB (15,26), with obstetric hemorrhage as the first cause of MM with 28,3 % for an MMR by obstetric hemorrhage of 19.81 x 100 000 LB.

The obstetric hemorrhage as the cause of MM in the CPM for the 1939-2020 period was 19.62 %, being 17.07 % in the 2013-2020 administrative period, representing the third cause of MM in the institution after hypertensive disorders of pregnancy and sepsis. The numbers are similar to the regional reality where 1 of each 5 MM is by hemorrhage according to the PAHO (25) and slightly inferior to the global reality where it represents approximately 25 % (4,5,10). The historic trend has been linear towards descending, except for the administrative periods between 1948-1958 when it reached a historical maximum of 38,8 %. Nevertheless, it represents a setback in the success of the public policies set during the millennium as that in the 1999-2001 administrative period was only 6.9 %.

In the linear descending historic trend for the MMR by obstetric hemorrhage and the obstetric hemorrhage as MM cause in the CPM since 1939 to 2020, it must be taken into account that in the decades of 1940 and 1950 a great number of pregnant women were assisted by a midwife with scarce knowledge about the obstetric care, as they did it empirically, with few tools for the diagnosis and proper management of the obstetric hemorrhage, where the first hour is vital in terms of prognosis. In actuality, the health care team activates the "Red Code" that did not exist in those times (8,9,11,12).

Therefore, the health care of the pregnant woman was implemented by qualified doctors as a measure to identify complications of the expectant mothers and their transfer to the CPM on time, as it is crucial to stop a hemorrhagic process and preserve the life of the woman, considering the delays in receiving the proper diagnosis and treatment, as decisive factors in the dramatic outcome of the MM (11,12,22,23). At the end of the 1950-decade, pregnant woman care was no longer performed at home but in the hospital.

It is worthwhile to notice that the inclusion of fluid therapy, oxytocic's, and other drug products as vitamin K, misoprostol, and tranexamic acid, along with the availability of blood bank for transfusion of blood products, the admission in

Intensive Care Unit for the hemodynamic support in cases of hypovolemic shock, as well as the advances in the protocols for medical treatment and surgical techniques in a progressive manner for the control of the obstetric hemorrhage from the second half of the XX century, ostensibly improved the therapeutic arsenal for the health professionals in the obstetric area in the attention of the EMM by obstetric hemorrhage with results that reflect the descending historic trend of the MM by obstetric hemorrhage during the second half of the XX century (12).

Sánchez, Aurrecoechea and Torres (30), establish common factors that explain with no doubt the influence of the loss of maternal lives and the little success obtained in the treatment of obstetric hemorrhage in comparison with the developed countries. Amongst these constraints, we find in the first place the "Sanitary Helplessness" referred to as the mothers who houses had difficulties to its access to warrant the obstetric surveillance at Infant – Maternal Centers and were transferred to the CPM from the interior of the country.

The second place, the "lack of sanitary culture" is explained by the great lack of attendance of the pregnant woman to the prenatal visits. The authors express that 71.15 % of the patients who died did not attend their prenatal control, or if they did it was on few occasions. In third place, there is the "social helplessness" meaning the lack of marital bonds that implied economic incapacities, which made it difficult to attend the medical visits or even hospitalization. Forth, the "Influence of the empiric midwife", with the request of another woman to accompany the labor without proper medical care or training.

In fifth place, they highlight the "condition of the patient at the admission" as a high percentage of the patients that were referred had severe complications. As per its regulations, the CPM received all pregnant women, regardless of where they came from and the condition she had, so many patients were received in very poor conditions for EMM, which related as an incidence in the MMR by obstetric hemorrhage.

Koch (31) refers that education is fundamental in the reduction of the MM, and maintains that the health public policies aimed to improve the education of the woman and promoting the planned and safe pregnancy to reduce the MM without the paradox of the legalization of the induced abortion. The reduction of the illiteracy in pregnant women, along with promoting safe pregnancies practices such as early prenatal control, the professional attention of the labor, and the obstetric care of high-risk cases are key factors to decrease the MM by hemorrhage, as it is intrinsically linked to social aspects.

Cabrera et al. (23), proposed six theoretical premises for the analysis of the MM, which are relevant to the analysis of the MM by obstetric hemorrhage contextualizing with the results obtained during this study:

1) The maternal death term is best defined as the tragedy of a pregnant woman expecting a happy event and ending with her death.

   The most important aspect is to take actions, so none occur as establishes the PAHO/ WHO strategy "Zero Maternal Deaths by Hemorrhage" (25). What happens is that the risk is dismissed and the possible pregnant woman those lives in poverty conditions is stimulated economically with alleged protection with some devaluated currency to get pregnant, which also stimulates the pregnancy in adolescents.

2) Proper family planning significantly impacts maternal death. With no doubt, along with the proper sexual and reproductive education and the proper access to the diversity of contraceptive methods, we shall decrease the maternal deaths of adolescents and those of the women that consider completed their progeny. Deepening the immediate Contraceptive Plan post obstetric event is a positive step in this sense.

3) No woman shall die for not knowing that she is in a risk situation. Theorizing the first delay of Thadeus modified by Maine (31,32), it is explained that the time that takes the pregnant woman is taking notice that she is bleeding and other symptoms in relation with the obstetric hemorrhage influence the maternal death.

4) The pregnant woman should be next to health centers with obstetric care and have the possibility of transport before any risk event, for the proper care. This is a direct determinant of morbidity/mortality in an

entity as the obstetric hemorrhage where it has been proven that the mortality is directly related to a delay of the attention, as well as the proper escalation in the quality of the required care (11,12,23).

5) It is indispensable to make public policies in sexual and reproductive health in a timely and effective manner. Once the pregnant woman is presumed in a risk situation of MD by obstetric hemorrhage, the requirement demands a diagnosis that must be verified, receiving timely treatment including the activation of the "Red Code", but she also has the risk that the facility cannot provide the proper attention, from the lack of supplies – drug products – blood products, until the absence of qualified personnel that can provide the proper attention.

The sanitary professionals in obstetric, maternal-fetal medicine and critical obstetrics shall learn to stop severe hemorrhages with hypovolemic shock using diverse simulators for the multimodal therapy including the use of the non-pneumatic anti-shock garment that can be placed in the bottom part of the body to the women experimenting a hemorrhage; and the intrauterine balloon that can be inserted in the uterus to reduce or stop the blood loss. They must also be trained to use the emergency by bleeding tool known as "Red Code ", and in cases of hypovolemic shock with no response to surgical measures (25), the capacity to establish within a period of a 1-hour reanimation and diagnosis, stabilization, and if it is required advanced support. That is the objective of such training in the quality care for obstetric hemorrhage, with or without hypovolemic shock.

The sanitary professional that handles the obstetric hemorrhage with or without hypovolemic shock must be conscious to make a diagnosis and early management of the obstetric hemorrhage due to the increase of the plasmatic volume that occurs in the woman during pregnancy, a determined percentage of volume loss represents a higher volume than that of a non-pregnant woman (34). The clinical parameters that shall be assessed are, in the first place, the state of conscience and the perfusion, as the pulse and blood pressure disturbances are delayed in a pregnant woman.

Among the modifiable factors in the attention of the obstetric hemorrhage and the hypovolemic shock to reduce the MMR by hemorrhage are the lack of organized and systematic teamwork, the delayed recognition of the shock, the lack of an approximated calculation of the blood loss, the inadequate reposition of crystalloids, the delay in the start of the administration of blood products, and a low percentage of utilization of the proper maneuvers to decrease the bleeding (34).

6) It is indispensable to make public policies in sexual and reproductive health in a timely and effective manner, deepening the already existent as the immediate contraceptive plan post obstetric event, the use of EUMA, and the "Zero Maternal Deaths by Hemorrhage" initiative. There is a great delay in the public policies of the State in decreasing the MM, and specifically, the MM by obstetric hemorrhage, what Cabrera (12), proposed as the fifth delay, in addition to the classic model of three delays of Thadeus and Maine (31), as well as the fourth delay proposed by Karolinski et al. (13), the curve that decreases with the creation and opening of the CPM, there were at the time public policies that contributed to the reduction of the MM by obstetric hemorrhage numbers that remained through the years in numerally acceptable values until 1999-2001, presenting an increase in the MMR by obstetric hemorrhage of approximately 4 times the MMR in the 2013-2020 administrative period in comparison with those observed for the beginning of the millennium. The epistemological and axiological makes us aware that we have even signed agreements and declarations that have not been considered for defining concrete actions to enforce them.

Faneite (35), when analyzing the MM, recommends guidelines of assistance activities that, in correlation with the analysis by theoretical premises of Cabrera (6) are beneficial for changing the current incidence of MMR by obstetric hemorrhage, under the knowledge that most of the MD are avoidable with viable and economic interventions. Among such activities are highlighted:

1. To organize institutionalized perinatal assistance programs at the district level with strategies of attack against the obstetric hemorrhage, the third cause of MM in the CPM.
2. To establish perinatal assistance programs prioritized by risk level, making emphasis at primary level, which would increase the coverage and improve the reference systems between the assistance levels in patients with obstetric hemorrhage, with proper provisions according to complexity levels.
3. Improve the functioning pregnancy medical practice and giving the proper provisions, with surveillance and stimulation and with priority for the patients bearing the detected local EMM pathologies such as the obstetric hemorrhage and other comorbidities that are frequently associated with it like hypovolemic shock, and hypertensive disorders of pregnancy.
4. To routinely establish the identification system and the prediction of pregnancies with risk for obstetric hemorrhage and hypovolemic shock, preemptively.
5. Multidisciplinary integration of the health professionals in the care of the pregnant woman with obstetric hemorrhage.
6. To provide the nosocomial labor rooms and at the primary level with the instrumental, sutures, antiseptics, oxytocic's, antibiotics, solutions, etc. To substantiate the critical obstetric units and the blood banks of the hospitals.
7. Routinely demand the autopsy studies in the cases of MM by obstetric hemorrhage.
8. Reaffirm the MM surveillance Committees.
9. Improve the systems of nosocomial registry and statistics, adapt them in terms of national and international recommendations.

Faneite, Rojas, and Briceño (36) refer the need to raise the quality of the medical act in patients with EMM for pathologies of DOMM as the obstetric hemorrhage with or without hypovolemic shock, far from the veil of distrust and safety that currently covers it, along with the disappearance of medical supplies, material and drug products that affects the sanitary system, in a Latin American context where up to 8.2 % of the pregnant woman may require a blood transfusion in the labor or abortion (25).

On the other hand, the hemorrhage related to the hypertensive disorders of pregnancy, although is frequent as a cause of EMM in that it represents 60.71 % as evidenced by the findings of Amato et al. (37), representing 32.74 % of the total, the MD by obstetric hemorrhage and hypovolemic shock is highly preventable and treatable, improving the quality of attention by levels of complexity, with timely and proper diagnosis and treatment, and modifying the social determinant factors of the MD, as reflected by the data of the MM in the Bolivarian region of Latin America in the study of Faneite (38).

The investigation of the EMM by obstetric hemorrhage and hypovolemic shock connecting the antenatal hospitalizations, its evolution, predictors of morbidity/mortality, and risk factors is a guideline of investigation that would provide academic – educative and assistance support improving the perinatal results, as per the postulations of Faneite et al. (39), increasing the efficiency and efficacy in the emergency obstetric cares by obstetric hemorrhage and septic shock, changing the lack of sanitary response that lead to the lack of compliance of the MDG (7) and be able to comply the SDG for the current agenda of the 2016-2030 period (6), as part of the Faneite's constructivist rationale about the strategies to follow (40,41).

The evolution of the MMR by obstetric hemorrhage in the CPM can defer in comparison with other third level attention centers of Caracas, as the study performed in the Hospital General del Oeste "José Gregorio Hernández", of Caracas, in which Uzcátegui, Centarini, and Armas (42), when analyzing their data found in the 1981-1994 period an MMR by hemorrhage of 13.75 x 100 000 LB, whilst in the 1979-1994 period of this study it was 27.70 x 100 000 LB, twice the numbers of MMR, probably in relation to the fact that the CPM was at that moment the national reference center.

The reality regarding the MM in the CPM can defer from that of other centers of the interior of the country, which lies in its historical evolution. When comparing the findings of this work with

the data of the Hospital "Dr. Adolfo Prince Lara", of Puerto Cabello, a model center of the country in the epidemiological assessment of the MM, when calculating the data extracted from such work, although it was not part of the objective of the study, the calculated MMR by obstetric hemorrhage was 55.24 x 100 000 LB, with 58.34 % as a cause of MD. Such numbers are in the proportions 2:1 as MMR by obstetric hemorrhage and 3:1 as a MM cause described and similar to the report of Faneite and Rivas in the 2005-2009 period and those found in this investigation at the same period (43).

The MMR by obstetric hemorrhage in the Hospital "Dr. Adolfo Prince Lara" was 17.05 x 100 000 RLB in the 2001-2004 period, calculated from the data registered by Faneite and García (44), with 33.33 % as a MD cause, below the finding at the CPM as MMR and higher above the findings in defining obstetric hemorrhage as a MD cause. The MMR by obstetric hemorrhage in the said center was 23.38 x 100 000 LB, with 47.37 % as MM cause in the 1992-2000 period, calculated from the data registered by Faneite and Starnieri (45), numbers much higher than those observed in the same period at the CPM.

CONCLUSIONS

1) The MD for obstetric hemorrhage in the CPM, as a national reference center, has historically been the third cause of DOMM, being smaller than worldwide, although with a very high MMR in relation to the Objectives of the Millennium and the Sustainable Development Goals
2) Among the keys to decreasing the MM by obstetric hemorrhage are the education and training of the health personnel in fetal-maternal medicine and critic obstetrics, with follow up of the clinical guidelines based on the protocolled evidence as to the so-called "Red Code" that may counteract the delays in which are the presence of organized and systematic teamwork. The proper provision in the health facilities of infrastructure and required supplies, required for the attention of the patient with hemorrhage and hypovolemic shock is urgent.
3) The analysis by theoretical premises that allow the identification of the social aspects of the MM and the sanitary reality related to its management, and the implementation of preventive public politics targeting the decrease of the high MMR by obstetric hemorrhage and hypovolemic shock, constitute an approach that transcends the conventional models that have addressed the problem of the delays in the access to the needed quality attention, modifying the social determinants and the quality of sanitary attention by complexity levels that have an incidence on the morbidity/mortality by hemorrhage in association to poverty and social inequity.
4) The integration of the analysis by theoretical premises with assistance guidelines that improve the operability and the multidisciplinary incorporation of the perinatal assistance programs in the attention of the pregnant woman with obstetric hemorrhage by complexity levels, including intensive care in critic obstetrics, positively impact the identification and the proper care of cases, as well as its posterior review by the MM committees.

RECOMMENDATIONS

1) To perform investigations on EMM in the CPM and other centers of the third level of national attention in emergency obstetric cares, that support the educational - academic for the assistance – sanitary action in addition to the public policies in sexual and reproductive health of the State regarding the obstetric hemorrhage and the hypovolemic shock.
2) To incorporate the analysis by theoretical premises with assistance guidelines in the programs of perinatal assistance of the main causes of EMM and MM, as well as the protocols of attention in prenatal care and emergency obstetric care, performing a follow up of the impact of such actions over the indicators of perinatal health, in relation with the national and international terms and recommendations.
3) To train doctors in the fetal-maternal medicine area and critic obstetrics to prevent and

control the EMM by obstetric hemorrhage and hypovolemic shock in an appropriate manner.

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