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Maternal mortality from hemorrhage in the State of Santa Catarina, Brazil

MORTALIDADE MATERNA POR HEMORRAGIA NO ESTADO DE SANTA CATARINA, BRASIL

MORTALIDAD MATERNA POR HEMORRAGIA OCURRIDA EN EL ESTADO DE SANTA CATARINA, BRASIL

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ABSTRACT

Hemorrhage represents a set of causes that focuses on women during the pregnancy and puerperal period, and that, with improper attention, results in death. The authors aimed to analyze maternal deaths related to hemorrhage that occurred in the state of Santa Catarina, Brazil. The data were obtained from the Mortality Information System and Live Births Information System from the Brazilian Ministry of Health. This was a descriptive study, in which 491 maternal deaths that occurred in the period 1997-2010 were analyzed. Of these, 61 were related to hemorrhage, corresponding to 12.42%; postpartum hemorrhage was the most prevalent cause, with 26 deaths, followed by placental abruption with 15, representing 67.21% of the cases. The maternal mortality from hemorrhage is a public health problem in the state of Santa Catarina, due to its high prevalence and the fact that its underlying causes are preventable.

DESCRIPTORS

Maternal mortality
Causes of death
Postpartum hemorrhage
Obstetrical nursing

RESUMO

A hemorragia representa um conjunto de causas que incide sobre a mulher durante o ciclo grávido-puerperal e com atenção indevida resulta em morte. Os autores têm como objetivo analisar as mortes maternas relacionadas à hemorragia ocorridas no estado de Santa Catarina, Brasil. Os dados foram obtidos junto ao Sistema de Informações de Mortalidade e Sistema de Informações sobre Nascidos Vivos do Ministério da Saúde do Brasil. Estudo descritivo no qual foram analisados 491 óbitos maternos ocorridos no período de 1997 a 2010. Desses, 61 estiveram relacionados à hemorragia, correspondendo a 12,42%, sendo a hemorragia pós-parto a causa mais prevalente, com 26 óbitos, seguida por descolamento prematuro de placenta com 15, representando 67,21% dos casos. A mortalidade materna por hemorragia é um problema de saúde pública no Estado de Santa Catarina, devido a sua alta prevalência e as causas básicas são preveníveis.

DESCRIPTORIOS

Mortalidade materna
Causas de morte
Hemorragia pós-parto
Enfermagem obstétrica

RESUMEN

La hemorragia representa un conjunto de causas que incide sobre la mujer durante el ciclo gestacional y puerperal, y con una atención indebida resulta en la muerte. Los autores tienen como objetivo analizar las muertes maternas relacionadas con la hemorragia, ocurridas en el Estado de Santa Catarina, Brasil. Los datos fueron obtenidos del Sistema de Información de Mortalidad y Sistema de Información sobre Nascidos Vivos, del Ministerio de Salud del Brasil. Estudio descriptivo en el cual fueron analizados 491 muertes maternas, durante el período de 1997 al 2010. De los cuales, 61 estuvieron relacionadas con la hemorragia, correspondiendo a 12,42%, siendo la hemorragia post-parto la causa más prevalente con 26 muertes, seguida por el desprendimiento prematuro de placenta con 15, representando el 67,21% de los casos. La mortalidad materna por hemorragia es un problema de salud pública en el Estado de Santa Catarina, debido a su alta prevalencia y las causas básicas que son prevenibles.

DESCRIPTORIOS

Mortalidad materna
Causas de muerte
Hemorragia postparto
Enfermería obstétrica

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INTRODUCTION

Postpartum hemorrhage is excessive blood loss associated with labor or birth of an infant. Defined as blood loss greater than 500 ml or as an amount which adversely affects maternal physiology, such as: blood pressure and hematocrit. It is divided into two categories: immediate (within 24 hours after birth) or late (24 hours after birth)⁽¹⁾.

Classically, postpartum hemorrhage (PPH) is defined as blood loss greater than 500 ml in vaginal delivery, and 1000 ml in a cesarean delivery⁽²⁾. In practice, the amount of blood loss is estimated subjectively, and severity of hemorrhage is frequently underestimated⁽³⁾.

The most common cause of PPH is uterine atony, a complication present in one out of every 20 births. The risk factors for atony are: multiple pregnancy, hidramnios, macrosomia, precipitated or prolonged labor, chorioamnionitis or simply the inability to contract the muscle caused by the use of tocolytic or general anesthesia⁽⁴⁾.

In one study⁽³⁾ conducted in Argentina and Uruguay, PPH was classified as moderate, in which the blood loss was at least 500 ml, and severe, in which the loss was 1,000 ml. In the same study, the following risk factors for PPH were identified: retained placenta (33.3%), multiple pregnancy (20.9%), macrosomia (18.6%), episiotomy (16.2%) and need for perineal suturing (15.0%). And in the case of severe PPH: retained placenta (17.1%), multiple pregnancy (4.7%), macrosomia (4.9%), induction of labor (3.5%), need for perineal suturing (2,5%)⁽³⁾.

Maternal death associated with hemorrhage is common in developing countries, where women are most exposed to risk as well as unfavorable economic conditions⁽⁴⁾.

The causes of maternal deaths in Brazil, regardless of the region, are related to hypertensive diseases and hemorrhage, alternating the position in some states, without analysis of determinants of the maternal deaths⁽⁵⁾. In Santa Catarina, a state in southern Brazil, in the whole bibliography consulted regarding maternal death, the maternal mortality ratio and the causes that triggered this event are presented. The results showed that a higher proportion of maternal deaths were direct obstetrical deaths, and that hemorrhage accounted for 30.3%⁽⁶⁻⁸⁾.

The basic causes of maternal death are difficult to estimate, especially in developing countries, where systems of records are inadequate and/or nonexistent. The data are associated to the uncertainty and difficulty in clearly identifying the cause of death such as maternal⁽⁹⁾. The death certificate is one of the sources for obtaining the basic cause of maternal death, in which the cause of death must be recorded in a clear and accurate form.

Since the year 1997, the registration of maternal death became the duty of states and municipalities in Brazil, for the determination of a normative act that declared maternal death to be a compulsory notification event. The measurement of maternal mortality can result in adequate definition of public policies. In the international context, qualified services and the improvement of obstetric care in health services to reduce maternal mortality are emphasized⁽¹⁰⁻¹¹⁾.

Considering the present scenario and that the Brazilian government is a signatory to the pact to reduce maternal mortality, related to one of the millennium development goals⁽¹⁰⁾, this study sought to answer the following question: how does maternal mortality from hemorrhage in the State of Santa Catarina present, and what does it reveal?

METHOD

This was a population-based, descriptive, retrospective, time series study, in the State of Santa Catarina. Data were collected from the DATASUS/Brazilian Ministry of Health, Mortality Information System – MIS⁽¹²⁾ and the Live Birth Information System - LBIS⁽¹³⁾, relative to women living in Santa Catarina, in the period of 1997 to 2010.

Deaths were identified from information contained in the death certificate, such as: year, region of occurrence and underlying cause, coded conforming to the ICD 10th revision⁽¹⁴⁾ in which diagnoses related to hemorrhage are defined. Therefore, we included deaths whose cause, by category, were classified as the following codes: O00 ectopic pregnancy, O43 placental disorder, O44 placenta previa, O45 placental abruption, O46 ante-partum hemorrhage not otherwise classified (NOC), O67 Labor and delivery complicated by intrapartum hemorrhage, (NOC), O72 postpartum hemorrhage.

The collected data were reviewed applying the correction factor resulting from research conducted in the Brazilian reality⁽¹⁵⁾. With the revised data, the Maternal Mortality Ratio from Hemorrhage (MMRH) was calculated for each year of the time series, and the percentage of deaths from hemorrhage conforming to the basic cause by ICD 10 category⁽¹⁴⁾. The MMRH was calculated adopting the formula: number of deaths from maternal cause related to hemorrhage, about the number of live births in the period, multiplied by a constant 100,000⁽¹⁶⁾.

This study was developed in the context of Catarina Macroproject: birth, life and death, approved by the Ethics Committee of the Federal University of Santa Catarina (CEPSH-UFSC), Protocol No. 209/2008, extended to

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July of 2012, observing that which determined Resolution No. 196/1996, of the Brazilian Ministry of Health.

RESULTS

In the period from 1997 to 2010, in the State of Santa Catarina, 61 deaths related to hemorrhage were identified, representing 12.42% of total maternal deaths. The data, by macroregion, about maternal deaths related to hemorrhage and its percentage distribution are shown in Table 1. The percentage ranged from 25.53% in the macroregion of Itajaí Valley to 7.89 in the macroregion of Serra Catarinense.

The data presented in Table 2 refer to maternal deaths from hemorrhage in specific categories according to ICD 10⁽¹⁴⁾, occurred in the State of Santa Catarina, in the period 1997-2010. Of the 61 maternal deaths from hemorrhage recorded in the period, the largest percentage was 42.62% of postpartum hemorrhage and the smallest was 1.64% disorder of the placenta.

The MMRH by macroregion of the state of Santa Catarina, in the period of 1997 to 2010, was 5.73 as shown in Table 3. The most RMMH by macroregion was found in the Itajaí River Mouth, with a value of 9.21, and the lowest was in the northeast macroregion, with 3.22.

DISCUSSION

Hemorrhage represents a set of causes that lead to a direct obstetrical maternal deaths, that is, one that occurs due to obstetric complications during pregnancy, childbirth or the postpartum period, due to interventions, omissions, incorrect treatment or a chain of events resulting from any of these causes⁽¹⁶⁾.

Hemorrhage during pregnancy, childbirth or the postpartum period is a set of causes of maternal death, that in ICD 10⁽¹⁴⁾ were grouped into categories. Variations were found in this study that demonstrated the need for attention, due to the action of indirect factors, such as incorrect completion of the investigation forms and of the death certificate. Inadequate records may result in numbers that do not adequately express the variations in the risk of these deaths⁽⁷⁾.

In the present study, the percentage of maternal deaths from hemorrhage in the state of Santa Catarina was 12.42%, as shown in Table 1. The percentage differences observed in all macroregions may indicate differences in the quality of existing health services as well as in the quality of completion of the death certificate. The highest percentage of deaths was identified in the macroregion of

Table 1 - Maternal mortality specific for hemorrhage, occurring in the State of Santa Catarina by health macroregion, in the period 1997-2010

Santa Catarina by health macroregion	Maternal Mortality														N	General (G)		
	Specific for Hemorrhage (E)															N	%	% E/G
	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010				
Itajaí Valley	3	-	1	1	-	5	2	-	-	-	-	-	-	-	12	47	9,57	25,53
South	-	-	1	2	1	-	1	2	-	1	2	-	-	-	10	75	15,27	13,33
Itajaí River Mouth	-	-	1	-	-	2	-	2	-	-	3	-	-	-	8	50	10,18	16,00
Midwest	-	-	-	-	-	-	1	-	5	1	-	1	-	-	8	67	13,65	11,94
Great Florianópolis	-	2	-	1	-	-	-	-	-	1	2	-	-	-	6	59	12,02	10,17
Great West	-	-	2	-	1	-	-	1	1	-	-	-	-	-	5	63	12,83	7,94
Northeast	-	-	1	-	-	-	1	-	1	-	-	-	1	1	5	60	12,22	8,33
Northern Plateau	-	-	-	-	-	-	-	-	-	2	1	-	1	-	4	32	6,52	12,50
Serra Catarinense	-	1	-	1	-	-	1	-	-	-	-	-	-	-	3	38	7,74	7,89
Total	3	3	6	5	2	7	6	5	7	5	8	1	2	1	61	491	100	12,42

Source: SIM/DATASUS⁽¹²⁾

Table 2 - Maternal death specific to hemorrhage, by categories of basic cause, occurring in the state of Santa Catarina, in the period 1997-2010

ICD 10 CATEGORY	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	Total	N
O72 Postpartum hemorrhage	1	1	3	1	1	5	1	2	2	3	3	0	2	1	26	42,62
O45 Placental abruption	1	1	2	2	1	1	1	2	1	0	2	1	0	0	15	24,59
O00 Ectopic Pregnancy	0	0	0	2	0	0	1	1	3	0	0	0	0	0	7	11,48
O44 Placenta previa	1	0	0	0	0	0	1	0	0	1	2	0	0	0	5	8,20
O46 Antepartum hemorrhage NOC	0	0	1	0	0	1	1	0	0	1	0	0	0	0	4	6,56
O67 Labor and delivery complicated by intrapartum hemorrhage NOC	0	0	0	0	0	0	1	0	1	0	1	0	0	0	3	4,92
O43 Placenta disorder	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1	1,64
Total	3	3	6	5	2	7	6	5	7	5	8	1	2	1	61	100

Source: SIM/DATASUS⁽¹²⁾

Itajaí Valley, at 25.53%. This high death rate may be associated with the lack of a system of reference and counter-reference that did not identify the risk of pregnancy, childbirth and postpartum, poor planning and neglect of pregnant women⁽⁸⁾.

Maternal death from hemorrhage is the worst obstetrical outcome, and in Recife, 25.4% of admissions in obstetric ICU were for this cause⁽¹⁷⁾. In Syria, a study conducted about the causes of maternal death showed that 88% of deaths were directly obstetrical, 65% of which related to hemorrhage, and that death occurred during labor and delivery. The inability and lack of clinical competence in providing care were the triggering factors in 54% of these deaths⁽¹⁸⁾.

Table 3 - MMRH occurring in the state of Santa Catarina by health macroregion, in the period of 1997 to 2010

Santa Catarina health macroregion	Specific Maternal Mortality Ratio by Hemorrhage (MMRH)														RMMEH in SC
	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	
Itajaí River Mouth	-	-	15,80	-	-	34,09	-	32,50	-	-	46,50	-	-	-	9,21
Itajaí Valley	26,80	-	9,12	9,59	-	52,30	21,60	-	-	-	-	-	-	-	8,53
Midwest	-	-	-	-	-	-	12,40	-	60,60	12,30	-	12,80	-	-	7,01
South	-	-	7,80	16,60	8,80	-	9,63	19,20	-	9,60	19,66	-	-	-	6,52
Northern Plateau	-	-	-	-	-	-	-	-	-	38,60	19,61	-	21,20	-	5,67
Serra Catarinense	-	19,40	-	22,04	-	-	24,05	-	-	-	-	-	-	-	4,68
Great West	-	-	16,80	-	9,84	-	-	10,94	11,38	-	-	-	-	-	3,50
Great Florianópolis	-	15,02	-	7,07	-	-	-	-	-	7,74	15,35	-	-	-	3,23
Northeast	-	-	8,34	-	-	-	9,90	-	9,37	-	-	-	8,60	8,87	3,22
RMMEH in SC/Ano	2,98	3,82	6,43	6,14	2,07	9,60	8,62	6,96	9,04	7,58	11,24	1,42	3,31	0,99	5,73

Source: SIM/DATASUS⁽¹²⁾

A review study about expectant and active management of the third stage of labor showed that active management in labor was introduced in an attempt to reduce hemorrhage, a major cause of death⁽²³⁾. In addition, the authors addressed active management as an effective action for women with high risk for hemorrhage, who may succumb during childbirth due to the absence of qualified personnel and supplies, such as uterotonic medication.

A technology for the reduction of maternal mortality from hemorrhage are the basic emergency obstetrical services (parenteral oxytocin, antibiotics and anticonvulsants, assisted deliveries, manual removal of the placenta, removal of retained products) and, if necessary, other comprehensive emergency obstetric services (basic services, caesarean section or blood transfusions)⁽²⁴⁾. In Malaysia, a study showed that maternal mortality rates decreased more among women referred for emergency obstetric care than among those who presented themselves without referral to the health center of the district⁽²⁵⁾.

The MMRH presented irregularities, as can be seen from the data presented in Table 3. The values obtained did not have uniform variation of increase or decrease, there may not be a trend exhibited⁽⁶⁾. In the series of this study, MMRH was 5.73 maternal deaths from hemorrhage for every 100,000 live births, showing that the risk for death that a pregnant woman had from hemorrhage was five times higher than from other causes.

Data presented in Table 2, according to the categories of ICD 10⁽¹⁴⁾, showed that postpartum hemorrhage was the most frequent cause in the series studied, with a proportional variation different from placental abruption, which was the second cause.

Postpartum hemorrhage occurs in approximately 4% of vaginal deliveries and estimates are that 25% have death as an outcome⁽¹⁹⁾. Furthermore, a study about maternal death that adopted the near miss^(a) as a reference showed that hemorrhage is among the most common events, preceded by hypertensive complications, and that the maternal mortality rates were reduced based on knowledge about how to intervene on this problem⁽²²⁾.

In the present study, the distribution of MMRH in the Itajaí River Mouth macroregion reached the value of 9.21/100,000 live births for the series studied, above the mean of the state of Santa Catarina. This result may be associated with deficiencies in health care in urgent and emergency obstetrical care, the inexistence of systems of reference and counter-reference, among others.

Studies about maternal death related to hemorrhage confirmed that MMR was an important indicator for assessing the event and the quality of maternal-infant care services^(6,8).

CONCLUSION

The analysis of maternal deaths from hemorrhage in the state of Santa Catarina revealed that it was a clinical manifestation whose occurrence was linked to regional conditions. The highest percentage (25.53%) in the macroregion of Itajaí may be associated with difficulties in identifying women with high risk pregnancy, the lack of referral services and early identification, with proper referral of pregnant women by the primary care services.

In the series of this study, the MMRH was 5.73 maternal deaths from hemorrhage for each 100,000 live births,

^a An almost death for any complications during pregnancy, childbirth or the postpartum period, but that survived due to chance or good hospital care ⁽²⁰⁻²¹⁾.

indicating that the risk that a pregnant woman has of dying from hemorrhage was five times greater than from other causes. The high maternal mortality with unstable MMRH revealed the risk of death from hemorrhage to which women were exposed in all geographical regions in the state of Santa Catarina. This showed that the event was not adequately controlled in the context of health care services, despite the existence of clinical and surgical technologies. It also demonstrated the need for the development of skills for the adequate management of the third stage of labor.

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