



Comparison between near miss criteria in a maternal intensive care unit

Comparação entre os critérios de *near miss* na unidade de terapia intensiva materna

Comparación entre los criterios de *near miss* en la unidad de cuidados intensivos materna

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How to cite this article:

Monte AS, Teles LMR, Oriá MOB, Carvalho FHC, Brown H, Damasceno AKC. Comparison between near miss criteria in a maternal intensive care unit. Rev Esc Enferm USP. 2018;52:e03404. DOI: <http://dx.doi.org/10.1590/S1980-220X2017038703404>

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ABSTRACT

Objective: The aim of this study was to compare the incidence of different criteria of maternal near miss in women admitted to an obstetric intensive care unit and their sensitivity and specificity in identifying cases that have evolved to morbidity. **Method:** A cross-sectional analytical epidemiological study was conducted with women admitted to the intensive care unit of the Maternity School Assis Chateaubriand in Ceará, Brazil. The Chi-square test and odds ratio were used. **Results:** 560 records were analyzed. The incidence of maternal near miss ranged from 20.7 in the Waterstone criteria to 12.4 in the Geller criteria. The maternal near-miss mortality ratio varied from 4.6:1 to 7.1:1, showing better index in the Waterstone criteria, which encompasses a greater spectrum of severity. The Geller and Mantel criteria, however, presented high sensitivity and low specificity. Except for the Waterstone criteria, there was an association between the three other criteria and maternal death. **Conclusion:** The high specificity of Geller and Mantel criteria in identifying maternal near miss considering the World Health Organization criteria as a gold standard and a lack of association between the criteria of Waterstone with maternal death.

DESCRIPTORS

Near Miss, Healthcare; Maternal Mortality; Morbidity; Obstetric Nursing; Intensive Care Units.

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Received: 09/27/2017
Approved: 07/10/2018

INTRODUCTION

Research shows that maternal mortality represents only the tip of an iceberg, in which there are several women who survive complications during pregnancy, childbirth, and the puerperium, and may have different degrees of sequelae⁽¹⁻²⁾.

In view of this, for more than two decades a new condition has been studied: severe maternal morbidity or maternal near miss (MNM). This is a condition defined when a woman is close to dying, but survives a complication during pregnancy, childbirth or up to 42 days after a pregnancy termination⁽²⁾.

Several criteria have been reported in the literature to define MNM with different advantages and disadvantages. The criteria of Mantel⁽³⁾ adopt the occurrence of maternal organic dysfunction and focus on serious diseases that should not cause death if there was proper care, but on the other hand, they depend on the existence of a minimal level of care, including lab tests and material for critical patient monitoring. The criteria of Waterstone⁽⁴⁾ are based on specific pathologies, are simple to use, however very wide-ranging and only value the degrees of greater severity of various harms. Geller's criteria⁽⁵⁾ propose a multiple approach, and are mainly based on obstetric hospitalizations in intensive care units (ICU). Therefore, they present the serious disadvantage of more restricted utility in services with more intensive care availability.

In order to standardize these criteria, the World Health Organization (WHO) published, in 2009, a list of 25 defining criteria for MNM⁽⁶⁾. These are divided into clinical, laboratory and management criteria; respecting the interest in identifying organic dysfunctions.

With the recognition of which MNM criterion is more sensitive to the detection of maternal mortality, it will be possible to implement it in the health services, to optimize the visualization of cases and reduce the number of deaths. The present study is justified by the high number of maternal deaths, due to the absence of studies comparing the four main MNM criterion and the importance of research in Ceará that provides an in-depth analysis of maternal morbidity and mortality.

The objective of this study was to compare the incidence of different maternal near miss criteria in women admitted to an obstetric intensive care unit and the sensitivity and specificity in identifying cases that have evolved to morbidity.

METHOD

A cross-sectional analytical epidemiological study was conducted with 560 women admitted to the maternal ICU of the Maternity School Assis Chateaubriand, a tertiary referral maternity of the Universidade Federal do Ceará, in Brazil, between January 2010 and December 2014. This maternity hospital is a public facility, linked to the Brazilian Unified Health System, thus it is a tertiary-level maternity hospital, with one of the two maternal ICUs available in Ceará, concentrating the largest number of cases of women with severe maternal morbidity. On average, it assists 500 pregnant women monthly.

Data were obtained through the hospitalization records of the sector. During the collection of the data, there were 882 hospitalizations in the ICU, but 322 cases were excluded, being

180 because women were not in the gestational or puerperium period and 142 because their medical records were not located.

The instrument for data collection was adapted⁽⁶⁾ from its individual form published by the WHO, which brings the recommendations for implementation of the MNM's research approach within a health service. The instrument was divided into 2 parts, with part I consisting of socio-demographic and obstetrical data and part II presenting the four MNM criteria. The criteria of Waterstone, Geller, Mantel and WHO are described in Chart 1.

From the Mantel and Geller criteria, the item referring to admission to ICU was excluded, since all medical records collected were from women who were admitted to Maternal ICU.

Chart 1 – Criteria to identify maternal near miss.

MANTEL	WATERSTONE
Pulmonary edema	Severe pre-eclampsia
Cardiorespiratory arrest	Eclampsia
Hypovolemia (≥ 5 unit)	HELLP syndrome
Intubation / Ventilation > 60min	Severe bleeding
Oxygen saturation < 90%	Severe sepsis
PaO ₂ /FiO ₂ < 300mmHg	Uterine rupture
Oliguria	GELLER
Urea / Creatinine > 400mmol/L	Organic insufficiency
Jaundice + Pre-eclampsia	Transfusion (≥ 3 unit)
Thyrototoxic crisis	Prolonged intubation (>12h)
Acute thrombocytopenia	Surgical intervention
Coma for more than 12 hours	
Subarachnoid hemorrhage / Intraparenchymal	
Emergency hysterectomy	
WHO (Management)	WHO (Clinical)
Continuous use of vasoactive drugs	Shock
Cardiopulmonary resuscitation	Cardiac arrest
Intubation/ventilation > 60 min, not related to anesthesia	Acute cyanosis
Dialysis for acute renal failure	Gasping breathing
Large blood transfusion / red blood cells (≥ 5 unit)	Respiratory rate > 40 or < 6/min
Hysterectomy (hemorrhage or infection)	Oliguria nonresponsive
WHO (Laboratory)	Coagulation failure
Severe hypoperfusion	Jaundice + pre-eclampsia
Severe acidosis (pH < 7.1)	Prolonged loss of consciousness
Oxygen saturation < 90%	Stroke
PAO ₂ /FiO ₂ < 200mmHg	Total paralysis
Creatinine ≥ 3.5 mg/dl	Uncontrollable seizures
Acute thrombocytopenia	

The data were analyzed using the statistical program Statistical Package for the Social Sciences, version 20.0. To evaluate the association between the variables, the Chi-square test and odds ratio (OR) were used. A level of significance of $p < 0.05$ with a confidence interval of 95% were considered. The sensitivity and specificity of the Mantel, Waterstone and Geller criteria were estimated in identifying cases of MNM considering the WHO criteria as the gold standard. Therefore, sensitivity is the proportion of individuals with near miss (other criteria) that truly have near miss according

to the gold standard (WHO criteria). The specificity of a test is the proportion of individuals with no near miss in the population that does not really have near miss according to the gold standard (WHO criteria). The research project was approved by the Maternity Research Ethics Committee under opinion number 1.148.039 of 2015 according to Resolution No. 466/2012 of the National Health Council.

RESULTS

Among the 560 records analyzed, 215 were included in the WHO MNM criteria, 221 women in the Mantel criteria, 347 in Waterstone and 208 in the Geller criteria.

Table 1 – Indicators for monitoring women hospitalized in the maternal ICU, according to the different MNM defining criteria, Maternity School Assis Chateaubriand – Fortaleza, CE, Brazil, 2010-2014.

INDICATORS	WHO	MANTEL	WATERSTONE	GELLER
Absolute number of cases of MNM ¹	215	211	347	208
Incidence of MNM ²	12.8	12.6	20.7	12.4
MNM ratio ³	15.5	15.3	22.4	15.0
MNM ratio: Mortality ⁴	4.7:1	4.6:1	7.7:1	4.6:1
Mortality rate ⁵	17.3%	17.5%	12%	17.9%
Maternal mortality ratio in ICU ⁶	263.5/100,000 live births			

1. Absolute number of cases of MNM;

2. MNM/1.000 live births;

3. (MNM+Maternal mortality)/1.000 live births;

4. NM: 1 Maternal mortality;

5. Maternal mortality/(MNM+Maternal mortality);

6. Maternal mortality/100,000 live births.

The incidence of MNM ranged from 20.7 in the Waterstone criteria to 12.4 in the Geller criteria. In the 5-year period studied, there were 16,694 live births in the referred hospital, obtaining an MNM ratio of 22.4/1,000 live births for the Waterstone criteria. For the other criteria, the ratio was lower and similar, 15/1,000 live births for Geller, 15.3/1,000 live births for Mantel and 15.5/1,000 live births for WHO. If the item referring to ICU admission was added, the Geller and Mantel criteria would have an MNM ratio of 33.5/1,000 live births (Table 1).

The MNM ratio: maternal death varied from 4.6:1 to 7.1:1, showing better index in the Waterstone criteria. That is, every 4 to 7 cases of MNM a death occurs. The mortality rate ranged from 12 to 17.9%.

Of the medical records analyzed, there were 45 maternal deaths in the maternal ICU during the 5 years of study. One death was excluded from the maternal mortality ratio calculation because it was caused by a traumatic brain injury due to an automobile accident. Thus, the maternal mortality ratio of the present study was 263.5/100,000 live births.

The socio-demographic profile had a higher concentration in the age group of 20 to 34 years (58.7%), among married women (56.8%), those who lived in the state capital (54.3%), had up to nine years of study (75.3%), no work (62.1%) and non-white skin color (87.3%).

The Mantel most prevalent criterion was intubation/ventilation for more than 60 minutes (20.9%). Waterstone presented severe preeclampsia as the most prevalent criterion with 29.6%, followed by eclampsia and HELLP syndrome. The most prevalent Geller criterion was organ failure, with 29.5%.

Table 2 – Absolute numbers and percentage of presentation of the various MNM defining criteria in women hospitalized in the maternal ICU, Maternity School Assis Chateaubriand – Fortaleza, CE, Brazil, 2010-2014.

MANTEL	N	%	WHO (Clinical)	n	%
Pulmonary edema	62	11.1	Shock	106	18.9
Cardiorespiratory arrest	50	8.8	Cardiac arrest	50	8.8
Hypovolemia (≥5 unit)	56	9.9	Acute cyanosis	1	0.2
Intubation/ventilation>60min	117	20.9	Gaspings breathing	5	0.9
Oxygen saturation < 90%	16	2.8	Respiratory rate >40 or < 6/min	8	1.4
PaO ₂ /FiO ₂ < 300mmHg	6	1.1	Oliguria nonresponsive	46	8.1
Oliguria	46	8.1	Coagulation failure	5	0.9
Urea/creatinine > 400mmol/L	21	3.8	Jaundice + pre-eclampsia	19	3.4
Jaundice + Pre-eclampsia	19	3.4	Prolonged loss of consciousness	22	3.9
Thyrotoxic crisis	1	0.1	Stroke	3	0.5
Acute thrombocytopenia	43	7.6	Total paralysis	4	0.7
Coma for more than 12 hours	22	3.9	Uncontrollable seizures	11	1.9
Subarachnoid hemorrhage/intraparenchymal	3	0.5			
Emergency hysterectomy	34	6.1	WHO (Laboratory)	n	%
			Severe hypoperfusion	1	0.2
WATERSTONE	N	%	Severe acidosis (pH < 7.1)	16	2.8
Severe pre-eclampsia	172	29.6	Oxygen saturation < 90%	16	2.8
Eclampsia	125	22.7	PAO ₂ /FiO ₂ <200mmHg	6	1.1
HELLP syndrome	90	16.1	Creatinine ≥ 3.5mg/dl	13	2.3
Severe bleeding	41	8.5	Acute thrombocytopenia	43	7.6
Severe sepsis	44	7.4			
Uterine rupture	2	1.2	WHO (Management)	n	%
GELLER	N	%	Continuous use of vasoactive drugs	95	16.7
Organic insufficiency	165	29.5	Cardiopulmonary resuscitation	45	7.9
Transfusion (≥3 unit)	81	14.5	Intubation/ventilation >60 min, not related to anesthesia	117	20.9
Prolonged intubation (>12h)	117	20.9	Dialysis for acute renal failure	40	7.0
Surgical intervention	104	18.6	Large blood transfusion / red blood cells (≥5 unit)	56	9.9
			Hysterectomy (hemorrhage or infection)	34	6.1

Among the clinical criteria, shock (18.9%) was the most commonly identified. Among the laboratory criteria, thrombocytopenia (7.6%) was the most prevalent. The most frequently identified management criteria were intubation/ventilation > 60 minutes (20.9%).

Regarding WHO criteria, management criteria were the most prevalent, as they appeared 387 (50.8%) times. Clinical criteria appeared 279 (36.7%) times and laboratory criteria 95 (12.5%) times. This indicates the clinical severity conditions of the study participants, since the highest incidence was found in the management criteria.

The MNM analysis performed allowed the correlation of the criterion proposed by the WHO with those already existing. As the criteria are based on different approaches, variation in sensitivity and specificity is also expected. The WHO classification has as a differential the possibility to identify the most serious cases, so that is why it was analyzed as the gold standard.

Table 3 – Sensitivity and specificity of the MNM criteria considering the WHO criteria as a gold standard in women hospitalized in the maternal ICU, Maternity School Assis Chateaubriand – Fortaleza, CE, Brazil, 2010-2014.

Other criteria	WHO Criteria ^{a,b}		Sensitivity	Specificity
	Yes	No		
GELLER				
Near miss	198 (78.9)	53 (21.1)	76.2	82.7
No near miss	62 (19.6)	255 (80.4)	(70.6–80.9)	(78.1–86.6)
WATERSTONE				
Near miss	185 (49.5)	189 (50.5)	71.2	38.6
No near miss	75 (38.7)	119 (61.3)	(65.3–76.3)	(33.3–44.2)
MANTEL				
Near miss	220 (85.9)	36 (14.1)	84.6	88.3
No near miss	40 (12.8)	272 (87.2)	(79.7–88.4)	(84.2–91.4)

a: WHO criteria for diagnosing MNM cases was employed as reference (reference standard).

b: In parentheses: 95% confidence intervals.

At the other extreme, the Waterstone criterion encompasses a greater range of severity, identifying more patients than the others, having a high sensitivity, but low specificities, and may not detect healthy women, that is, they are more likely to indicate false positives. The Geller and Mantel criteria, however, had high sensitivity and specificity, that is, a greater ability to detect women who did not have MNM.

Except for the Waterstone criterion, there was an association between the three other criteria and maternal death. Analysis of the Geller criterion shows that those who had MNM were 31.7 (95% CI 7.6–132.4) times more likely to progress to death.

Table 4 – Association between MNM criteria and death of women hospitalized in the maternal ICU, Maternity School Assis Chateaubriand – Fortaleza, CE, Brazil, 2010-2014.

Criterion	Maternal death	P value *	OR (CI 95%)
WHO			
Yes	45 (17.3)	<0.001	-
No	-		
MANTEL			
Yes	45 (17.6)	<0.001	-
No	-		
WATERSTONE			
Yes	27 (7.2)	0.314	0.7 (0.3-1.3)
No	18 (9.7)		
GELLER			
Yes	43 (17.1)	<0.001	31.7 (7.6-132.4)
No	2 (0.6)		

* Pearson's chi-square.

All the women who died were classified according to the WHO ($p < 0.001$) and Mantel criteria ($p < 0.001$), making it impossible to calculate the odds ratio.

DISCUSSION

The incidence of MNM depends on the criterion considered. There is a broad spectrum described in the literature, ranging from 1.6 to 21.5 per 1,000 live births, depending on the level of complexity of health care⁽⁷⁻⁸⁾. A cross-sectional study carried out in a reference university hospital in the state of São Paulo found an incidence rate three times lower than that of the present study, of 4.4 cases of MNM per 1,000 live births. This low incidence can be explained by the fact that the referred hospital is not a major reference center for risk pregnancies⁽⁹⁾.

The variation in the incidence of MNM between the Waterstone criteria and the WHO criteria was not so significant when compared to the extensive discrepancy in the incidence of MNM reported in a Netherlands study, in which in total there were 7,007 events reported, of which 2,638 (37.6%) were Waterstone criteria and 1,179 (16.8%) WHO criteria⁽²⁾.

In a study carried out also in an obstetric ICU, when considering criteria based on Waterstone, the ratio was 27.8/1,000 live births, much higher than that based on Mantel (10.2/1,000 live births) or Geller criteria (2.1/1,000 live births). On the other hand, a higher frequency of mortality was identified when Mantel criteria were adopted, with one case of maternal death occurring in six cases of MNM. When using Waterstone, as defining criteria, a case of death occurred in every 35 cases of MNM⁽⁹⁾.

The MNM ratio: maternal mortality was very low, similar to other Brazilian and East African studies, in which the ratios were 5.3:1 and 7:1, respectively⁽⁷⁻⁸⁾. "The maternal near miss mortality ratio estimates the complexity of care and refers to the ratio of maternal near miss cases and maternal death. This ratio also represents the proportion of

maternal near miss cases that progressed to maternal death; the higher the ratio, the better the quality of care that the women received⁽¹⁾.

“Clearly, maternal near miss cases are more likely to die in resource-poor settings⁽¹⁾. The maternal mortality ratio, using similar WHO criteria⁽⁶⁾, was higher in Rwanda, Nigeria, and Uganda, with 325/100,000 live births, 503/100,000 live births and 1,088/100,000 live births, respectively^(8,10-11). “This high ratio could be attributable to several factors, such as a lack of initial treatment facilities, delayed referral to a higher care center, and underestimation of the severity of the condition and therefore a delay of necessary actions⁽¹²⁾.”

A cross-sectional study conducted in Malaysia found a mortality index of 4.1%, disagreeing with findings in which the lowest percentage was 12% in the Waterstone criteria and the highest 17.9% in the criteria of Geller⁽¹⁾. In a Tanzanian archipelago off the coast of East Africa, “for every 10 cases of maternal death there were 13 maternal near-miss cases corresponding to a mortality index of 0.43⁽¹³⁾.”

“The mortality index is an indicator to represent an estimate of performance. This index refers to the number of maternal deaths divided by the number of women with maternal near miss and maternal death and is expressed as a percentage⁽¹⁷⁾. Thus, when it is high (over 20%), the quality of obstetric care for severe cases is not considered adequate⁽¹⁴⁾. It is necessary that comparisons between studies using different approaches be carefully evaluated, as there may be a four- to six-fold increase in studies that are based on less specific criteria⁽¹⁵⁾.”

The socio-demographic data found corroborate with research done in a Brazilian northeastern state, in which 40% of the women with MNM were between 20 and 29 years⁽¹⁶⁾. In a study conducted in France and in a state in the South of Brazil, the mean age of women admitted to the ICU was 30.5 and 29 years, respectively^(7,17). Some authors consider that the highest incidence of maternal complications occurs in women of greater age, with black or brown skin color, lower educational level and worse socioeconomic conditions^(10,16).

Among the comorbidities that most classified women as MNM cases, hypertensive syndromes (severe pre-eclampsia, eclampsia and HELLP syndrome) were the most prevalent in the Waterstone criteria when compared to the other three criteria. In another Brazilian study⁽¹⁸⁾, hypertensive syndromes were also one of the causes most commonly associated with severe maternal morbidity and near miss, reaching 23.7%. In Malaysia, “among women with severe maternal morbidity, hemorrhagic disorders (68.6 %) were the most common criteria for morbidity followed by severe management indicators (54.4 %) and hypertensive disorders (33.4%)⁽¹⁾.”

In a study carried out in the region of Tanzania, in East Africa, “the admission to the ICU, “post-partum hemorrhage and uterus rupture have the highest case-fatality rates⁽¹³⁾.” In Malaysia “management-based parameters were also the most frequently associated criteria for near miss (85.1%) followed by laboratory-based criteria (40.4%)⁽¹⁾.” This finding strengthens the specificity of management-based criteria in detecting severe obstetric cases for MNM.

It is advantageous to have different types of classification for clinical, laboratory and management criteria. However, the lack of availability of some markers of laboratory criteria becomes a limitation, which is why most cases are identified by clinical and management criteria. There are financial difficulties in performing several specialized laboratory exams in many Brazilian healthcare units.

The most frequent MNM events in our study were cardiovascular, coagulation-hematological and respiratory dysfunctions, in agreement with other investigations⁽¹⁹⁾. In India, 25% of the women with MNM required cardiopulmonary resuscitation and 86% had to be transfused with more than 5 blood bags⁽²⁰⁾.

In the analysis of specificity and sensitivity, it was found that, in the approach proposed by Waterstone, the number of MNM cases was on average 60% higher than in the other criteria. Current results show that the Waterstone criteria tend to detect four times more cases than the WHO criteria. That showed there was a difference in the identification of morbidity cases according to the criteria used^(15,18).

This fact that can be explained by the Waterstone criteria, which has three options involving hypertensive syndromes (severe pre-eclampsia, eclampsia and HELLP syndrome). Most women are characterized as MNM for presenting these comorbidities, since it corroborates with another Brazilian study in which the Waterstone criteria also identified more cases of MNM than the others⁽¹⁸⁾.

“The WHO is advocating a uniform approach in defining and analyzing maternal near miss to foster comparison. This approach has been developed and tested in middle-income countries and has shown to be applicable over a wide range of conditions in both large trials and at single institutions. A main point of discussion is whether, in resource-poor environments, it may lead to underreporting because of restrictions in applicability of some, most commonly laboratory criteria⁽¹³⁾.”

This fact was confirmed by a study that aimed to analyze the WHO MNM tool in one high- and two low-resource settings, indicating in their results that “the WHO MNM tool, in its current form, is not useful for comparison between different resource settings”. Detection differs between high and low-income countries; WHO criteria detect only 38.2% of all women with MNM⁽²¹⁾.

“In a study on obstetric patients admitted to the ICU, which compared scores on the WHO tool and the total maximum sequential organ failure assessment (SOFA) score as the gold standard, the WHO near miss criteria had a sensitivity of 100% and specificity 70.4% for prediction of maternal deaths⁽¹¹⁾.”

The low specificity of the Waterstone criteria was confirmed by association with maternal death, since Waterstone was the criteria that least classified the women who died (Table 4). Hence the importance of using the WHO criteria as the gold standard. Since 2009, when the WHO proposed these criteria, more reliable comparisons were possible, with differences in incidence of MNM depending on the socioeconomic characteristics of each region or country, the structure and resources available in each hospital, and the organization of referral networks⁽²²⁾.

In obstetrics, nursing professionals have a fundamental role in the care of women with MNM, since they provide care starting at the prenatal period, requesting routine exams, registering pregnant women and classifying them in the low- or high-risk group. Nursing professionals work in obstetric emergency units, in a decisive moment in the recognition of urgent clinical conditions and in the ICU that have uninterrupted nursing care, besides needing an adequate foundation of tools that subsidize and assure their work process.

Our data corroborate the importance of using WHO criteria as a reliable tool in the identification of severe cases, even with little use of laboratory resources for patients hospitalized in medium- or high-complexity units.

The limitations of the study can be pointed out in the often incomplete medical records found, the lack of laboratory tests in many cases of obstetric complications and the fact that admission to an ICU is an objective inclusion criterion, since it is possible that not all women with MNM have received intensive care.

It is suggested that internal MNM audit committees be set up in maternity hospitals as well as maternal morbidity surveillance protocols to assess critical cases and professional conduct, so there will be a strong performance in preventing the development of severity and, consequently, death.

CONCLUSION

The number of cases with MNM defining criteria and the MNM ratio in the Waterstone criteria were higher than in the other criteria evaluated. There was a high specificity of the Geller and Mantel criteria in identifying MNM considering the WHO criteria as the gold standard and a lack of association between the Waterstone criteria and maternal death.

Although some adjustments may be still required, the WHO approach should be reinforced since it is based on the accumulated knowledge of many experts and its adequacy has been empirically corroborated. In turn, the Waterstone approach may still be useful in identifying severe maternal morbidities and employed as a first step to rule out maternal near miss.

RESUMO

Objetivo: O estudo tem o objetivo de comparar a incidência de critérios diferentes de *near miss* materno em mulheres admitidas em uma UTI obstétrica e a sensibilidade e especificidade de identificação dos casos que evoluíram para morbidade. **Método:** Estudo transversal epidemiológico-analítico, composto por mulheres admitidas em UTI da Maternidade Escola Assis Chateaubriand no Ceará, Brasil. Os testes qui-quadrado e Odds Ratio foram utilizados. **Resultados:** 560 registros foram analisados. A incidência de *near miss* materno variou de 20,7 nos critérios de Waterstone a 12,4 nos critérios de Geller. A proporção de mortalidade *near miss* erro materno variou de 4,6:1 a 7,1:1, demonstrando melhor índice nos critérios de Waterstone, o que abrange um maior espectro de gravidade. Os critérios de Geller e Mantel, contudo, apresentaram alta sensibilidade e baixa especificidade. Exceto pelos critérios de Waterstone, houve uma associação entre os três outros critérios e morte materna. **Conclusão:** Foi encontrada alta especificidade de critérios de Geller e Mantel na identificação do *near miss* materno considerando os critérios da Organização Mundial da Saúde como padrão-ouro e uma falta de associação entre os critérios de Waterstone com a morte materna.

DESCRITORES

Near Miss; Mortalidade Materna; Morbidade; Enfermagem Obstétrica; Unidades de Terapia Intensiva.

RESUMEN

Objetivo: El estudio tiene el fin de comparar la incidencia de criterios distintos de *near miss* materno en mujeres ingresadas en una UCI obstétrica y la sensibilidad y especificidad de identificación de los casos que evolucionaron a morbidad. **Método:** Estudio transversal epidemiológico analítico, compuesto de mujeres ingresadas en UCI de la Maternidad Escuela Assis Chateaubriand en Ceará, Brasil. Las pruebas de chi-cuadrado y Odds Ratio fueron utilizadas. **Resultados:** 560 registros fueron analizados. La incidencia de *near miss* materno varió de 20,7 en los criterios de Waterstone a 12,4 en los criterios de Geller. La proporción de mortalidad por *near miss* materno varió de 4,6:1 a 7,1:1, demostrando mejor índice en los criterios de Waterstone, lo que abarca un mayor espectro de gravedad. Sin embargo, los criterios de Geller y Mantel presentaron alta sensibilidad y baja especificidad. Excepto por los criterios de Waterstone, hubo una asociación entre los tres otros criterios y muerte materna. **Conclusión:** Fue encontrada alta especificidad de criterios de Geller y Mantel en la identificación del *near miss* materno considerando los criterios de la Organización Mundial de la Salud como regla de oro y una ausencia de asociación entre los criterios de Waterstone con la muerte materna.

DESCRIPTORES

Near Miss Salud; Mortalidad Materna; Morbilidad; Enfermería Obstétrica; Unidades de Cuidados Intensivos.

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