

Systematic review on the incidence and prevalence of severe maternal morbidity

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Key words: severe maternal morbidity, "near-miss", severe obstetric morbidity, complications of pregnancy and delivery.

Summary. *Objective.* To summarize the prevalence and the incidence of serious morbidity from studies reporting data on severe maternal morbidity and to compare study designs and definitions.

Methods. A literature search was used to identify relevant studies, which report data on prevalence/incidence of severe complications during pregnancy, delivery and postpartum. For assessment of the quality of studies a structured data collection form from World Health Organization for systematic review of maternal mortality and morbidity was used. Incidence / prevalence and case-fatality ratios were extracted.

Results. In this review 24 studies were included, most of them – cross-sectional hospital based (16/24). In ten studies data about one severe maternal condition (admissions to intensive care unit, and hysterectomy) was presented, while fourteen studies dealt with multiple causes of severe maternal morbidity (rupture of uterus, hemorrhage, sepsis, and hypertensive disorders of pregnancy). In these studies very different inclusion criteria due to structure of diseases and severity were used.

Conclusions. The prevalence of severe maternal morbidity ranged from 0.07–8.23% and the case-fatality ratio from 0.02–37%. Studies estimating the incidence of severe maternal morbidity have used different definitions and ways of identification. Severe hemorrhage, sepsis and hypertensive disorders of pregnancy are the commonly used "near-miss" conditions. Further work will be able to create clear definition and method of identification.

Introduction

The analysis of maternal deaths has long been used as a criteria for evaluating women's health, in addition to the quality of obstetric care. The figures for maternal mortality are low in European countries. In the European Union, around 10 to 20 maternal deaths per 100,000 live births are observed annually (in 2000 maternal mortality was 1.2 in Ireland, 3.5 in Austria and 3.4 in Sweden) (1). In Lithuania maternal mortality was 12.4 per 100,000 (2 cases per year) in 2001; it dramatically increased to 20.4 per 10,000 (6 cases) in 2002 (2). In Lithuania, there is no scientific indicator for evaluation of this type of medical care.

Because of the small number of cases the evaluation of maternal mortality is practically impossible. For this reason, it would be appropriate

to include those women who suffered from severe maternal complications, so-called "near miss" cases (3).

Even though there is a large number of studies examining the severe complications of the pregnant and laboring women, the real rate of morbidity among this group of women is still not known.

The aim of this systemic review is to evaluate the studies dealing with morbidity from severe obstetric complications and to evaluate the methods used, in addition to comparing the different definitions.

Material and methods

Criteria for inclusion in the systemic review. The studies included in this review all rendered data about the prevalence of severe obstetric

complications, various risk factors, or provided information about with medical care provided in the case these complications arise. Studies who discussed different interventions done to decrease morbidity were also included.

Collection of data. During the search we employed the use of medical databases such as Ovid (Medline), Popline, and Scielo. Keywords we searched for included: severe maternal morbidity, near miss, human, female and adults. We included studies published between 1998 and 2003. We performed a selective search in such journals as: Lancet, European Journal of Obstetrics and Gynecology, and the British Medical Journal. In some cases, full articles were obtained directly from the authors. We discarded those articles, which were completely irrelevant and nevertheless were picked by the search engines.

Assessment of the quality of studies and collected data. For assessing the quality of the studies, structured data collection forms from WHO systemic reviews of maternal morbidity and mortality were used (4). The quality of the study was evaluated using the following criteria:

- The description of the period of the study;
- Information about the study population and their specific characteristics;
- Information about the place of delivery;
- Description of the setting the study was carried out (medical institution, regional hospital, etc.);
- Information about eligible and lost subjects and their characteristics;
- Definition of the different concepts and conditions (severe bleeding, preeclampsia, sepsis);
- Qualified processing of data.

Data about the morbidity of pregnant and laboring women suffering from severe maternal complications, in addition to the prevalence of various risk factors and other etiologic factors were closely evaluated. We also evaluated the number of maternal deaths and their cause. The mortality rate was calculated by dividing the number of deaths by the number of “near miss” cases.

Results

Our search generated 30 articles. Six articles were discarded because they did not contain information about the prevalence of maternal complications (5-10). Twenty-four studies were included in the systemic review.

Main characteristics of the studies. Table 1

contains the main characteristics of the various studies included in the study. Sixteen studies are cross-sectional, carried out in hospitals and where maternal mortality and morbidity rates due to severe maternal complications were calculated retrospectively using medical data and available medical records. Data was collected prospectively in 2 cohort studies (11, 12) and 1 case control study (13), in addition to 3 cross-sectional studies (14-16). Two studies presented national data (Great Britain (17), Canada (18)). Eleven studies chose the setting of their study to be only 1 hospital, while others were multicenter studies. Still other studies reflected data from regional and/or national hospitals. The number of women included in the studies ranged from 3777 to 182,589. One of the largest studies was a cohort study in African countries, where trained personnel regularly visited and interviewed all women in their homes (11). Pregnant women were observed and evaluated 4 times during their pregnancy and until 60 days postpartum. Additional data was collected from family members, relatives and medical personnel. In total, 20,326 women participated in the study. Another large study was carried out in 13 West European countries and included 182,589 and 1,843 severe obstetric cases. (19).

Table 1 shows that in different studies, defining of various obstetric complications might be different. The use of similar but yet different terminology is illustrated by the following: cases of “near miss”, morbidity of severe obstetric disease, morbidity of acute severe obstetric disease, morbidity of severe disease of pregnant and laboring women. In 9 studies, cases of “near miss” were those cases when the pregnant or laboring woman was treated in the Intensive care unit (ICU) irrespective of cause. One study considered emergency hysterectomy during delivery as a marker for morbidity (20). The remaining 15 studies discussed the severe obstetric complications and presented data about their prevalence. A Canadian study defined morbidity of severe obstetric complication to be: the number of women who had a life-threatening condition for each 100,000 live births in any given place at any given time (18). “Near miss” cases in 6 African countries were due to severe complications arising between the 28th week of gestation and 42 days after delivery and which would have been lethal or irreversibly devastating, in cases medical help was not available (11). In the study done in Morocco, “near miss” cases were those cases when women who had just delivered or aborted and whose life was

Table 1. The characteristics of the studies included in the systemic review

Study, country, type	Place of the study, evaluated population	Number of participants	Number of cases	Investigated conditions	Diagnostic criteria	Comments
1	2	3	4	5	6	7
Nasrat H A, 1998 (20) Saudi Arabija, cross-sectional	Medical institution / Village	18 842	23	Cases of „near miss“	Hysterectomy during delivery or in the early postpartum period	
Koeberle P, 2000 (35), France, cross-sectional	Medical institution / not defined		46	Morbidity of severe obstetric diseases	Admission to the ICU	
Willatts S H, 2000 (17), Great Britain, cross-sectional	Data from the National audit for Intensive care database	46 857	393	Cases of „near miss“	Admission to the ICU	
Pruhal A, 2000 (11) 6 East African countries (Mauritania, Burkina Faso, Senegal, Mali, Nigeria, Ivory Coast) cohort population prospective	The whole population / mixed	20 326	1307	Mortality rate of severe obstetric diseases	Clear diagnostic and clinical criteria for the diagnosis of obstetric diseases	
Baskett T F, 1998 (36), Canada, cross-sectional	Medical institution / mixed	76 119	55	Cases of „near miss“	Admission to the ICU	
Souza J P D, 2002 (37) Brazil, cross-sectional	IIIrd level medical institution / not defined	28 660	40	Cases of „near miss“	Admission to the ICU	Stillbirths – 19%
Sivalingam N, 2002 (28), Malaysia, cross-sectional	Medical institution / not defined	9 932	122	Cases of „near miss“	Admission to the ICU	Medical care is evaluated
Ben Lataifa D, 2002 (29), Tunis, cross-sectional	Medical institution / not defined	24 812	20	Mortality rate of severe obstetric diseases	Admission to the ICU and need for artificial respiration	30% of women died
D. J. Murphy, 2002 (34), Great Britain cross-sectional	IIIrd level medical institution / not defined	51 756	50	Cases of „near miss“	Admission to the ICU	Perinatal mortality rate – 14%
Bhuinneain M N, 2001 (38), Ireland, cross-sectional	2 medical institutions / not defined	67 650	26	Mortality rate of severe obstetric diseases	Admission to the ICU	

Table 1 (continuation)

1	2	3	4	5	6	7
Duffy S, 2001 (39), Ireland, cross-sectional	IIIrd level medical institution / not defined	20 800	19	Mortality rate of severe obstetric diseases	Admission to the ICU	
Pruhal A, 1998 (22), Nigeria, cross-sectional	6 medical institutions / not defined	4 081	232	Morbidity of severe obstetric diseases	Diagnosis is based on the clinical diagnosis	
Mantel G D, 1998 (14), 2000 (13, 16, 40) South Africa, cross-sectional, prospective, 2 year audit	4 medical institutions / not defined	13 854 and 26 152	147 and 359	Mortality rate of severe obstetric diseases	Clear clinical criteria. Classification is based on organ dysfunction and treatment.	
Waterstone M, 2001 (25), Great Britain, population-based prospective, case-control	25 hospitals / mixed	48 865	588	Mortality rate of severe obstetric diseases	Clinical diagnosis based on laboratory findings. Severe hemorrhage >1500ml or or >4 units of blood or Hb decreases to 40g/l	
Bernis L, 2000 (12), Senegal, population-based prospective, cohort	2 regions / urban	3 777	261	Mortality rate of severe obstetric diseases	Criteria according to the clinical diagnosis or intervention	Comparison of obstetric care and indicators in 2 different regions
Filippi V, 1998 (23), Benin, cross-sectional	Medical institution / not defined	4 291	353	Cases of „near miss“	Not defined	
Khosla A H, 2000 (24), India, cross-sectional	Medical institution / mixed	5 124	224	Cases of „near miss“	Not defined	
2000 (18), Canada, ecological	National data / mixed	–		Morbidity of severe obstetric diseases	Clinical diagnosis	Data collected from different studies, and presented by a special group of the Canadian Perinatal Health care system
Geller S E, 2002 (27), USA, cross-sectional	Medical institution / urban	–	319	164 women were classified as severely ill, and 22 were near miss cases based on a quantitative scale	The identification of women with severe obstetric diseases and near miss cases according to the diseases, syndromes, and interventions	Aim of the study - defining „near miss“ cases and the creation of a system for identification using a special quantitative scale

Table 1 (continuation)

1	2	3	4	5	6	7
Schoon M G, 1999 (15), South Africa, cross-sectional, population-based	Region / mixed	34 100	163	Cases of „near miss“	Clear clinical criteria	
Vandecruys H B, 2002 (16), South Africa, ecological, prospective	Region / not defined	40 006	426	Mortality rate of severe obstetric diseases	Clinical criteria	Data from different years are compared
Girard F, 2001 (26) France, cross-sectional	Region / not defined	27 875	223	Mortality rate of severe obstetric diseases	Proven clinical diagnosis	
MOMS-B study, 1998 (19, 21, 41), cross-sectional	13 European countries: Austria, Belgium, Finland, Hungary, Ireland, Italy, Norway, France, Great Britain and others / mixed	182 589	1 843	Mortality rate of severe obstetric diseases	Proven clinical diagnosis	
Sahel A, 2001 (32), Morocco, cross-sectional	2 hospitals / mixed	5686	76	Cases of „near miss“	Clear clinical and laboratory criteria	

threatened, and later survived either due to good medical care or by luck (32). “Near miss” cases in South Africa are those cases when the pregnant or laboring woman has organ system dysfunction (cardiovascular, immunologic, coagulation defects, kidney or lung problems), all emergency hysterectomies, anesthesiology complications, admissions to ICU, all cases who would not have survived without adequate medical care (14).

All 15 studies explored the prevalence of the 3rd trimester complications, such as hemorrhage, sepsis and uterine rupture. Cases of emboli and thromboembolism were only registered in Canada and South Africa (11, 15, 16). In developing countries, caesarean sections, dystocia, and ectopic pregnancy were considered as life-threatening conditions (11, 12, 22, 24, 32). The majority of studies limited themselves to the analysis of the 3rd trimester complications. Only few explored possible complications of the 1st trimester due to abortion or ectopic pregnancy (14, 16, 24). In most studies, women were included due to the apparent clinical signs (11, 16,

24-26); 2 studies used criteria for evaluating end organ damage (cardiovascular, immunologic, kidney dysfunction and others) (14, 15).

Quality control of the studies. All studies were evaluated according to the WHO requirements and criteria for quality control. Most studies are of poor quality and do not meet the required standards. Information about lost eligible subjects (4 out of 24 studies) and description of the setting of the delivery (6 out of 24 studies) was very rare. A little less than half of the studies provided statistically significant data (10 out of 24 studies). Most common sources of data were medical records, patient questionnaires, and various patient databases. The data presented in the Geller and Waterstone study was collected from 5 sources: medical records, delivery registrars, morning rounds, hospital admission and discharge records, operation databases, insurance notices, and transport registrars (25, 27). Eighteen authors tried to describe the setting, in which the study took place, however in most cases this information was minimal. A detailed description of the

medical institution (number of deliveries, number of wards in the ICU, facilities for blood transfusion, anesthesiologist, and dispersion of treated patients) was presented in very few studies (11, 12, 14, 26). The condition of the patients was more or less described in two thirds of the studies; however the concept of maternal death was defined more rarely (11 from 24 studies). Only in studies carried out in West African countries and Great Britain large efforts were made to document all cases of maternal death (women were observed 42 days postpartum, data was collected from national death registrars) (11, 12, 25).

Discussion

Nine studies regarded “near miss” cases to be those cases where the women were admitted to the ICU. The reason behind the admission of these women to the ICU was due to one of the following: hemorrhage, hypertensive states and / or sepsis. However, women with other conditions not related to the pregnancy or delivery were also treated in this unit. Other conditions included: accidents, surgical or oncologic diseases. Thus the true morbidity from obstetric causes was not reflected. Furthermore, the indications for admission into the ICU are different in various countries. That is why there can be no true objective obstetric morbidity rate.

The mortality rate of pregnant or laboring women is presented in Table 2. Irrespective of the different similarities, the presented numbers in different countries are very similar. They range from 4-17 per 1,000. Only Malaysia has a higher rate (123 per 1,000) (28). All countries have similar death rates

of those women who were treated in the ICU except in Tunisia where every third pregnant or laboring women who was admitted to the ICU died (29).

An analysis of maternal death is done in Great Britain every three years. Near miss cases were included in the published report for 1997-1999. All cases of admission to the ICU of pregnant and laboring women were discussed (30, 31). The results conclude that this is effective in evaluating the efficiency of new methods of treatment.

Table 3 shows the largest studies that evaluated the causes, the prevalence and mortality rates of “near miss” cases. These indicators should be compared with caution for certain reasons. In most studies, the numbers of deliveries are considered as the denominator, whereas a few studies regard the live number of births as the denominator.

In various countries the morbidity rate of severe obstetric disease is similar (0.8-8.2%).

Without a doubt, the fatality ratio is an objective indicator for the quality of obstetric care. It is the ratio between the number of maternal deaths and all cases of women who experienced life-threatening complications. This ratio allows us to compare data from different countries and consequently to evaluate the quality of obstetric health care. Mortality from severe obstetric complications ranges from 0.02 to 37%.

Fatality ratio depends on the quality of healthcare. The mortality indicators greatly differ between developed and developing countries. Data in all studies carried out in South Africa, showed that 1 woman from 5 die, in addition to 1 from 3 cases of “near miss”(14-16). Life-threatening con-

Table 2. Rate of treatment and mortality of pregnant and laboring women in the ICU

Study	Country	Rate of treatment (%)	Mortality (%)
Basket T F, 1998 (36)	Canada ²	0.07	4.2
Koeberle P, 2000 (35)	France ¹	0.17	not defined
Bhuinneain M N, 2001 (38)	Ireland ¹	0.04	not defined
Duffy S, 2001 (39)	Ireland ¹	0.09	5.3
Sivalingam N, 2002 (28)	Malaysia ¹	1.23	not defined
Murphy D J, 2002 (34)	Great Britain ¹	0.1	6
Souza J P D, 2002 (37)	Brazil ¹	0.14	4.9
Ben Lataifa D, 2002 (29)	Tunis ³	0.08	30

¹denominator – deliveries; ²denominator – pregnancies; ³denominator – live births.

Table 3. Prevalence (1) and mortality (2) of "near miss" cases and other obstetric diseases in various countries (%)

Study	„Near miss“ cases		Uterine rupture		Bleedings		Sepsis		Eclampsia		Dystocia		Trombo-embolia	
	1	2	1	2	1	2	1	2	1	2	1	2	1	2
Prual A (11), East Africa ²	6.7	3.1	0.1	30	3.1	2.8	0.1	33.3	0.2	18	2.1	0	0.02	50
Prual A (22), Nigeria ²	6.4	13.7	0.1	0	0.9	14.5	0.2	50	0.2	5.9	3.4	3.2	–	–
Mantel GD (14), South Africa ¹	1.1	20.4	–	–	0.3	5.3	0.2	27.6	–	–	–	–	–	–
Vandercruys HB (16), South Africa ¹	1.1	20	–	–	0.8	–	0.7	–	–	–	–	–	–	100
Waterstone M (25), Great Britain ¹	1.2	0.9	0.03	0	0.7	0.3	0.04	17.6	0.02	0	–	–	–	–
Bernis L (12), Senegal ¹	7.1	5.4	–	–	2.3	6	0.2	0	1.7	4.8	2.2	0	–	–
Filippi V (23), Benin ¹	8.2	8.5	–	–	2.3	9.2	0.4	21	1	4.7	4.5	3.6	–	–
Khosla AH (24), India ¹	4.4	13.8	–	–	1.3	9	0.7	26.3	1	52.4	–	–	–	–
Kanada (18) ¹	0.07	3.6	1	low	2–12*	low	low	3–50	0.05–0.2	5.8–14	–	–	0.3–0.001	3–30
Schoon M G (15), Pietu Africa ¹	5.3	37.4	–	–	0.06	27.3	0.03	72.7	–	–	–	–	0.02	83.3
Girard F (26), France ¹	0.8	0.5	–	–	0.39	0.9	0.03	0	0.4	0	–	–	–	–
Sahel A (32), Morocco ³	1.4	0.7	0.2	0	0.2	40	0.05	0	0.4	0	–	–	–	–
MOMS-B study, 13 European countries ¹ (19, 21, 41)	1.0	–	–	–	0.5	–	0.1	–	0.43	–	–	–	–	–

* When Caesarean section is the mode of delivery.

¹denominator – deliveries; ²denominator – live births; ³denominator – admissions to hospital.

ditions are fatal for 1 woman from 11 in countries like India and Nigeria (22, 24). In developed countries, this indicator is 10 times less: in Great Britain

1 woman from 118 dies, in France 1 woman from 222, in cases of severe obstetric disease (25, 26). The indicators of severe obstetric morbidity also

vary: they depend on the countries' economic social and health care levels: Senegal and Nigeria 4-8%, Great Britain, Canada, and France 0.07-1.2% (12, 18, 22, 25, 26). It is obvious that better obstetric care leads to the incremental decrease of the mortality rate, in addition to the number of cases with severe complications.

All studies included hemorrhage, sepsis, and eclampsia. Dystocia and consequent caesarean section are life-threatening complications only in developing countries.

In most cases thromboembolism was not included in cases of "near miss" because of the absence of specific diagnostic criteria even though mortality from this disorder remains the highest (30-100%). The prevalence of thromboembolism was evaluated only in Canada and in South and West Africa (11, 15, 18). In Canada 3% of treated cases are lethal, and up to 30% of untreated cases are lethal (18). In South Africa this rate ranges between 83 and 100% (11, 15, 16).

Hemorrhage. The prevalence of bleeding is the highest (2-3%) in West Africa (all cases of bleeding and blood transfusion were included), Benin, Senegal and Canada (criteria were not defined) (11, 12, 18, 23). Those studies, which have had harsher inclusion criteria, showed a much smaller prevalence of bleeding (<1%). A population study in Great Britain showed that only 0.03% of women lost more than 1500 ml of blood during delivery (25). Such hemorrhage is 10 times more common in France, and mortality is 3 times higher (26). In Benin, Nigeria, and India, between 1-2% of deliveries are complicated by hemorrhage, and one woman out of eleven dies as a consequence (22-24).

The differences in prevalence of sepsis in different countries is not large, they largely depend on non-identical levels of obstetric help. In African countries, sepsis is diagnosed ten times more often than in Great Britain, France and Canada (0.1-0.7%) (11, 12, 14, 16, 18, 22, 23, 26). The mortality rate as a result of sepsis clearly illustrates the difference in the quality of medical care: women do not die from sepsis in Canada, Senegal, and France, whereas in Nigeria and South Africa the mortality rate ranges from 50-72% (12, 14, 18, 22, 26).

Half of women suffering from eclampsia in India die, whereas in other countries this complication is treated more efficiently, and mortality ranges from 0 to 18%. (11, 12, 18, 23, 24, 26, 32).

The prevalence of uterine rupture ranges from 0.01 to 1%, however this complication is lethal only for women from West African countries (1 out of 3). (11, 18, 22, 25, 32).

Evaluation of obstetric care, outcome and risk factors in studies exploring "near miss"

Recently it has become important to evaluate the risk for obstetric complications and the quality of obstetric care in addition to the common practice of calculating indicators of mortality and morbidity. Schoon and co-authors evaluated cases of "near miss" during a hospital audit. They presented clear conclusions about optimal and insufficient medical care. In 35% of cases medical care was optimal, in 14% of cases this care was insufficient, and in 51% of cases faulty health care was behind poor fate (15). Vandencruys and colleagues from South Africa compared how special means when applied to improve obstetric care, greatly improved the various indicators. They concluded that 40% of pregnant women were suffering from pregnancy-induced hypertension, and 42% of women who suffered from bleeding were offered incompetent health care (16). This method of evaluating obstetric care can help to point out worsening indicators, and thus can help change health care strategies (implement new methods of treatment, decentralize hospitals, increase the number of wards in the ICU) and thus to decrease maternal mortality and morbidity. A study carried out in Senegal showed that mortality decreased when labor was attended by a qualified obstetrician rather than by a midwife (12).

A cohort prospective population study was carried out in 6 West African countries and included 20326 deliveries. The importance of 10 prognostic factors was evaluated in foreseeing the possibility of near miss cases. It became evident that the most important factors were: bleeding during labor, high blood pressure, a history of caesarean section, or multifetal pregnancy (11). Waterstone and co-authors in Great Britain analyzed 331 cases and pointed out certain risk factors for severe obstetric complications: age >34 years, present or previous hypertension, caesarean section, multifetal pregnancy, social status, hospitalization prior to delivery, use of antidepressants and iron preparations (25).

A few researchers evaluated not only the morbidity of severe obstetric disease but also the long-term complications that may become evident later in life. They concluded that obstetric diseases

are closely related to the long-term health of women (33). It is statistically significant that they are admitted urgently to the hospital ($p < 0.001$), have sexual problems ($p < 0.001$), are more often treated on an outpatient basis ($p < 0.001$). Murphy and co-authors observed 47 women who had been admitted to the ICU for periods ranging from 18 months to 12 years after their discharge. They concluded that 62% of women completely recovered, 32% remained with some degree of disability and 3% died (34).

Conclusions

Morbidity rate of severe obstetric complications ranges from 0.8 to 8.2%, mortality rate from 0.02 to 37%, however due the fact that in different studies “near miss” cases are defined differently, the methodology and indicators should be compared with caution. The majority of “near miss” cases include severe hemorrhage, sepsis, hypertensive states, and uterine rupture. It is necessary to improve the quality of registration of cases with severe obstetric complications and to develop a clear definition.

Sunkių nėštumo ir gimdymo komplikacijų sisteminė literatūros apžvalga

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Raktažodžiai: sergamumas sunkiomis nėštumo ir gimdymo ligomis, nėštumo ir gimdymo komplikacijos, „beveik prarasti“ atvejai.

Santrauka. Darbo tikslas. Apibendrinti tyrimus, nagrinėjančius sunkias nėštumo ir gimdymo komplikacijas, palyginti šių komplikacijų terminus bei įvertinti tyrimams atlikti naudotus metodus.

Metodai. Atlikta sisteminė tyrimų, kur pateikiami duomenys apie sergamumą sunkiomis nėštumo ir gimdymo ligomis, rizikos veiksnius ir suteiktą gydymą, paieška. Tyrimų kokybės įvertinimui naudota PSO nėščiųjų bei gimdyvių sergamumo ir mirtingumo sisteminės apžvalgos rinkimo struktūrinė forma.

Rezultatai. Į sisteminę apžvalgą įtraukti 24 tyrimai. 16 iš jų – momentiniai ligoninėse atlikti retrospektyvieji tyrimai. Devyni tyrimai, analizuojant sergamumą sunkiomis nėštumo ir gimdymo ligomis, atlikti įtraukus nėščiųjų ir gimdyvių gydymo intensyvosios terapijos skyriuose atvejus, vienas tyrimas – identifikuojant visus histerektomijų atvejus gimdymo metu ar tuoj po jo. Likę tyrimai atlikti analizuojant sunkias nėštumo ir gimdymo komplikacijas: sepsį, gyvybei pavojingą kraujavimą, sunkias preeklampsijas ir eklampsijas, gimdos plyšimą. Gyvybei pavojingų būklių bei jų sunkumo vertinimo kriterijai, naudoti tyrimuose, skyrėsi.

Išvados. Sergamumas sunkiomis nėščiųjų ir gimdyvių ligomis svyruoja nuo 0,8 iki 8,2 proc., mirštamumas – nuo 0,02 iki 37 proc. Dėl tyrimų metu vartotų skirtingų „beveik prarastų“ atvejų sąvokų, identifikavimo būdų, metodikų šių rodiklių palyginimas gana ribotas. Į „beveik prarastų“ atvejų struktūrą dažniausiai įtraukiamas gyvybei pavojingas kraujavimas, sepsis, hipertenzinės nėščiųjų būklės, gimdos plyšimas. Taigi būtina tobulinti sunkių nėštumo ir gimdymo atvejų registraciją ir sukurti aiškų sunkių nėščiųjų ir gimdyvių ligų terminą.

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References

1. Maternal deaths. Atlas of Health in Europe. WHO; 2003. Available from: URL: <http://www.euro.who.int/document/E79876.pdf>
2. Demografinė statistika. (Vital statistics). Lietuvos statistikos departamentas. Available from: URL: http://www.lsic.lt/php/dm12.php?dat_file=dem12en.txt
3. Ronsmans C, Filippi V. Reviewing severe maternal morbidity: learning from women who survive life-threatening complications. In: Beyond the numbers (editorial). Geneva, WHO. In press 2004.
4. Department of Reproductive Health and Research. Systematic review on the epidemiological evidence for maternal morbidity and mortality 1997–2002. Geneva, WHO; 2002.

5. Cynthia JB, Bruc CF, Calaghan WM. From mortality to morbidity: the challenge of the twenty first century. *JAMWA* 2002;57:173-4.
6. Paruk F, Moodley J. Severe obstetric morbidity. *Current Opinion in Obstet Gynecol* 2001;13:563-8.
7. Filippi V, Gandaho T. The "near-misses": are life-threatening complications practical alternatives to maternal mortality indicators? Proceedings of the Seminar on Innovative Approaches to the Assessment of Reproductive Health; 1996 Sep 24–27; Manila, The Philippines. 1996. Available from: URL: <http://www.iusp.org/Activities/sep-heaprog96.php>
8. Sadana R. Measuring reproductive health: review of community-based approaches to assessing morbidity. *Bull WHO* 2000;78:640-54.
9. Fortney JA, Smith JB. Measuring maternal morbidity. In: Bere M, Ravindran TKS, editors. *Safe motherhood initiatives: critical issues*. Oxford: Blackwell Science; 1999. p. 1-8.
10. Martney JO, Djan JO, Twuns S, Browne, Opaku SA. Referrals for obstetrical complications from Ejisu district, Ghana. *WJAM* 1998;17:58-63.
11. Prual A, Bouvier-Colle MH, Bernis L, Beart G. Severe maternal morbidity from direct obstetric causes in West Africa: incidence and case fatality rates. *Bull WHO* 2000;78:593-602.
12. Bernis L, Dumont A, Bouillin D, Gueye A, Dompnier JP, Bouvier-Colle MH. Maternal morbidity and mortality in two different populations of Senegal: a prospective study (MOMA survey). *BJOG* 2000;107:68-74.
13. Report to the Gauteng Health Department. Why do mothers still die and how to prevent it? Medical Research Council of South Africa; 2001.
14. Mantel GD, Buchmann E, Rees H, Pattinson RC. Severe acute maternal morbidity: a pilot study of a definition for a "near-miss". *British J of Obstet and Gynecol* 1998;105:985-90.
15. Schoon MG. Analysis of all deaths in the province and all deaths and near-misses managed in health regions A and B. Report to the provincial head of health about maternal health study; 1999. Available from: URL: <http://www.doh.gov.za/docs/reports/mothers/fs.html>
16. Vandecruys HB, Patisson RC, ManDonald A, Mantael GD. Severe acute maternal morbidity and mortality in Pretoria Academic complex: changing patterns over 4 years. *Europ J Obstet&Gynec and Reprod Biol* 2002;102:6-10.
17. Willatts SM. Intensive care. Why mothers die 1997–1999. Ch. 19. p. 309-16. Available from: URL: <http://www.cemd.org.uk/reports/c19.pdf>
18. Canadian Perinatal Surveillance System Steering Committee and Health Surveillance and Epidemiology Division. *Perinatal Health Indicators for Canada: a resource manual*. Severe maternal morbidity ratio; 2000. p. 46-8. Available from: URL: <http://www.hc-sc.gc.ca/pphb-dgsp/rrhs-ssg/phic-isp>
19. Bouvier-Colle MH, Joud DOE, Varnoux N, Goffonet F, Alexander S, Bayoumeu F. Evaluation of the quality of care for severe obstetrical haemorrhage in three French regions *BJOG* 2001;108:898-903.
20. Nasrat HA, Youssef MHM, Marzoogi A, Talab F. "Near-miss" obstetric morbidity in an inner hospital in Saudi Arabia. *East Mediterr Health J* 1999;5:717-26.
21. Bouvier-Colle MH. Frequency and characteristics of obstetric patients admitted in intensive care unit: example of severe reproductive morbidity in developed countries. Proceedings of the seminar on Innovative Approaches to the Assessment of Reproductive Health. 1996 Sep 24–27; Manila, The Philippines. 1996. <http://www.iusp.org/Activities/sep-heaprog96.php>
22. Prual A, Huguet D, Garbin O, Rabe G. Severe obstetric morbidity of the third trimester, delivery and early puerperium in Niamey (Niger). *Afr J Repr Health* 1998;2:10-9.
23. Filippi V, Alihonou E, Mukantaganda S, Graham W, Ronsmans C. "Near-misses": maternal morbidity and mortality. *Lancet* 1998;351:145-6.
24. Khosla AH, Dahiya K, Sangwan K. Maternal mortality and "near-miss" in rural north India. *Int J Gynec & Obstet* 2000; 68:163-4.
25. Waterstone M, Bewley S, Wolfe C. Incidence and predictors of severe obstetric morbidity: case-control study. *BMJ* 2001; 322:1089-94.
26. Girard F, Burlet G, Bayoumeu F, Bouvier-Colle MH, Boutroy JL. Les complications severes de la grossesse et de l'accouchement: etat des lieux ne Lorraine dans le cadre de l'enquete europeenne. *J Gynecol Obstet Biol Reprod* 2001;30:10-7.
27. Geller SE, Rosenberg D, Cox SM, Kilatruck S. Defining a conceptual framework for near-miss maternal morbidity. *JAMWA* 2002;57:135-9.
28. Sivalingam N, Looi KW. Clinical experience with management of "near-miss" cases in obstetrics. *Medical J of Malaysia* 1999;54:496-503.
29. Ben Lataifa D, Daouas N. Maternal emergencies requiring controlled ventilation: epidemiology and prognosis. *Europ J Obstet & Gynec and Reprod Biol* 2002;31:256-60
30. The confidential Enquiries into maternal deaths ant United Kingdom. Why mothers die 1997–1999. Executive summary and key recommendations. Available from: URL: <http://www.rcorg.org.uk/mainpages.asp>
31. Hall MH. Near misses and severe maternal morbidity. In: *Why mothers die 1997–1999*. Ch. 21. p. 323-5. Available from: URL: <http://www.cemd.org.uk/reports/c21.pdf>
32. Sahel A, De Brouwere V, Lardi M, Van Larberghe W, Ronsmans C, Filippi V. Des catastrophes obstetricales žvitčes de justesse: les near miss dans les hōpitaux marocains. *Cahiers d'ćtudes et de rescherches francophones*. Sante 2001;11:229-35.
33. Waterstone M, Wolfe C, Hooper R, Bewleys S. Postnatal morbidity after childbirth and severe obstetric morbidity. *BMJ* 2003;110:129-33.
34. Murphy DJ, Charlett P. Cohort study of "near-miss" maternal mortality and subsequent reproductive outcome. *Europ J Obstet & Gynec and Reprod Biol* 2002;102:173-8.
35. Koeberle P, Levy A, Surcin S. Severe obstetric complications necessitating hospitalization and intensive care: a ten years retrospective study, *Ann Fr Anesth Reanim* 2000;19:445-51.
36. Baskett TF, Sternadatel J. Maternal intensive care and near-miss mortality in obstetrics. *British J of Obstet and Gynecol* 1998;105:981-4.
37. Souza JPD, Duarte J, Basile-Filho A. "Near-miss" maternal mortality in developing countries. *Europ J of Obstet and Gynecol and Reprod Biol* 2002;104:80-1.
38. Bhuinneain MN, Barry-Kinsella C, Coughlan BM, McKenna PF, Bosio P. Critical care admission of obstetric patients. *Irish Med J* 2001.94:51-2.

39. Duffy S, Geaffney G. Maternal admissions to ICU? Time to reevaluate. *Irish Med J* 2001;94:64-65.
40. Pattinson R, Vandecruys H, Macdonald AP, Mantel G. Why do women die during childbirth? *Science in Africa*. Available from: URL: <http://www.sciencein africa.co.za/2001/august/mothers.htm>
41. Bouvier-Colle MH. Severe maternal morbidity in Europe. Electronic response to: Waterstone M, Bewley S, Wolfe C. Incidence and predictors of severe obstetric morbidity: case-control study. *BMJ* 2001;322:1089-94.

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