ISSN: 2230-9926

Available online at http://www.journalijdr.com

IJDR

International Journal of Development Research
Vol. 08, Issue, 01, pp.18302-18306, January, 2018

ORIGINAL RESEARCH ARTICLE OPEN ACCESS

PUERPERAL INFECTION: A LITERATURE REVIEW

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ARTICLE INFO

Article History:
Received 18th October, 2017
Received in revised form
07th November, 2017
Accepted 20th December, 2017
Published online 31st January, 2018

Key Words:
Puerperal infection,
Postpartum period,
Maternal Mortality.

ABSTRACT

The pregnancy-puerperal cycle is understood from the fertilization to the end of the puerperium. In this period, woman requires differentiated and individualized care in order to achieve a physiological pregnancy, delivery and postpartum. However, puerperal infection still remains a major public health problem, evidenced by its high prevalence of morbidity and lethality. The objective was to review and discuss the studies on puerperal infection published in the period from 2010 to 2015. A systematic literature review was developed. For the search in the Virtual Health Library, we used the Descriptors: Puerperal Infection; Postpartum Period and Maternal Mortality. Initially, the search returned 239 articles related to the descriptors. After considering the inclusion and exclusion criteria, the sample resulted in eight studies. The evaluation of the findings pointed to puerperal infection as one of the main causes of maternal death. Unnecessary cesarean sections increases the incidence of puerperal infection and puts maternal health at risk.

Citation: Eliana Vieira do Nascimento Marinho, Flávia Jacqueline Oliveira da Silva, Liniker Scolfild Rodrigues da Silva, Edjane Maria de Barros and Cristina Albuquerque Douberin, 2018. "Puerperal infection: a literature review", *International Journal of Development Research*, 8, (01), 18302-18306.

INTRODUCTION

Demographic data indicate that women constitute more than half of the Brazilian population and are the main users of the Unified Health System (SUS) (IBGE, 2015), thus composing a social segment essential for the performance of public health policies. Therefore, inclusive and integral actions have been planned in order to ensure engagement of universal access to services, enabling the effectuation and overcoming historical shortcomings of the care offer to various situations that permeate women's health, especially pregnancy-puerperal stage (Santos *et al.,* 2016). During the pregnancy-puerperal cycle, which is the period from fertilization to the end of puerperium, the woman requires differentiated and individualized care in order to achieve a physiological pregnancy, childbirth and postpartum (Cabral; Hirt; Sand, 2013). Regarding puerperium, care to women is essential to maintain maternal and neonatal health and must include the father, the family in its various arrangements and all the social network involved in this phase of the life and family cycle. Puerperium begins immediately after delivery and, for a better health organization, can be divided into immediate, until the tenth day after childbirth; late, until de 42nd day; and remote,

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with unknown end. During this period, a series of anatomical and physiological changes in the female body prepares to return to the pre-pregnancy stage (Brazil, 2016). This phase concentrates the largest number of cases of maternal death (MD), defined as a woman's death during pregnancy or up to 42 days after childbirth, regardless of duration or location of pregnancy (Áfio *et al*., 2014). Furthermore, it can have direct and indirect causes. Direct causes occur by obstetric complications, related to interventions, omissions, incorrect treatment or a chain of events resulting from any of these causes. Indirect causes are a reflection of pre-existing diseases, or developed during pregnancy, not caused by obstetric causes, but exacerbated by the natural effects of pregnancy (Brazil, 2007). Inserted in this context, the current literature has demonstrated that direct causes are the most frequent causes of MD, with a higher incidence of infection/sepsis, hypertensive syndromes and puerperal hemorrhage (Roncon *et al*., 2013). In Brazil, however, puerperal infection is probably the leading cause of maternal death (Febrasgo, 2011).

According to the American Institute Centers for Disease Control (CDC), puerperal infection is diagnosed by finding any isolation of microorganism in the uterine cavity, rise in temperature equal to 38° C in the postpartum period (excluding the first day), presence of consistent and sudden tachycardia, purulent uterine drainage and abdominal pain accompanied by hypersensitivity, softened and hypoinvoluted uterus (Patel; Burnett; Curtis, 2003). Thus, puerperal infection results from any bacterial manifestation in the female genital tract entrant to the labor and birth process and is closely related to health assistance (Guimaraes; Chianca; Oliveira, 2007). Even with scientific and technological advances in various areas of knowledge, puerperal infection remains a major public health problem, evidenced by its high prevalence of morbidity and mortality (Duarte *et al*., 2014). The cesarean delivery, in isolation, is still the main risk factor related to this pathology. Factors such as low education level; precarious hygiene habits; and types of services offered may increase the occurrence of this unfavourable outcome (Brito *et al.,* 2016).
Believing that the findings of this research can subsidize the planning of actions at health services and contribute to the planning of strategies in the area of attention to birth and puerperium, in order to reduce maternal complications arising from infection, the following objective was traced: review and discuss the studies on puerperal infection published during the period from 2010 to 2015.

MATERIALS AND METHODS

This was an exploratory study with qualitative approach. The methodology consisted of bibliographical research for construction of a literature review that intends to gather information on a particular topic, in order to synthesize the knowledge production about a research problem and provide the reader with an understanding of what has been published on the subject. When providing the results of these researches, this methodology can assist professionals, researchers and students in their decision making, once they become aware of what has been researched on the subject (Polit; Hungler, 2011). To this end, a systematic review of the literature was performed, according to defined criteria and based on the following methodological steps: selection of the review issue; sample selection; definition of characteristics of the sample studies based on inclusion criteria defined by the authors; discussion and dissemination of the results.

The inclusion criteria to define the sample of this study were: works published in the period from 2010 to 2015 on puerperal infection, in national and international journals; works in Portuguese and Spanish and available free of charge and in its entirety. For the development of the literature review, electronic library Virtual Health Library (VHL) was chosen, which includes the following databases: Lilacs, Medline, Pub Med and Cochrane. Its choice was anchored by its relevance in the scientific world. Thus, assuming the founding intention to discuss puerperal infection, we decided to focus the search and investigative works in the publications of that database. For access, we used: Puerperal Infection; Post-Partum Period and Maternal Mortality. The search returned 239 articles, of which 199 were fully available and/or free of charge. After analyzing the title, 23 were selected. Of these, after reading the entire material, the sample of this systematic review resulted in eight scientific articles, as shown in figure 1. Since this study does not involve human beings directly, it did not require evaluation by the Ethics Committee, in accordance with Resolution 466/2012 of the National Health Council.

RESULTS ANDDISCUSSION

The eight articles included in this systematic review of literature were analyzed according to year, journal, country and language of publication, study method and categorized according to their results and discussions in the thematic groups: puerperal infection of genital causes, as shown in table 1, which has a synthetic definition of the studies. Solidification of motherhood happens with postpartum, in the so-called elipuerperium. This unique and special time of life is covered by different meanings for each woman, as well as for her family. It is also considered a critical and transition phase. Its complexity can be conferred by the interweaving of various aspects, such as biological, psychological, emotional, behavioral, sociocultural, economic, and gender issues (Lima *et al.,* 2014). In this period, the woman becomes more vulnerable to certain complications, such as bleeding, damages related to lactation, cardiac changes, depression, puerperal infections, among others (Araújo; Reis, 2012). Therefore, puerperal infection is an important cause of maternal death in the world. Its first reports have been clearly described since ancient times by Hippocrates, though without a specific name. Initially, this disease was called puerperal fever, due to the symptoms presented by the woman. In the 18thcentury, there was a great interest to research this phenomenon due to its epidemic and the growing number of maternal deaths. In ancient history, deliveries were performed by midwives who did not have scientific knowledge for performing this task. Moreover, when the birth occurred at a hospital, it occurred in precarious hygiene conditions (García, 2013).

An important milestone in the reduction of maternal mortality from puerperal infection came in the 19thcentury, with the obligatory hygiene and decrease in invasive interventions during births. Even with the absence of academic knowledge, complications in natural births performed by midwives had already reduced when compared to those of the hitherto surgeons (García, 2013),becoming notorious the greater vulnerability conferred to invasive procedures. In this situation, the estimates are an average of 75,000 maternal deaths/year, particularly in underdeveloped countries, with incidence of 0.1-0.6 per 1,000 births. The main causes of maternal deaths in Brazil, in the years from 2000 to 2009, were: other mother's diseases that complicate pregnancy,

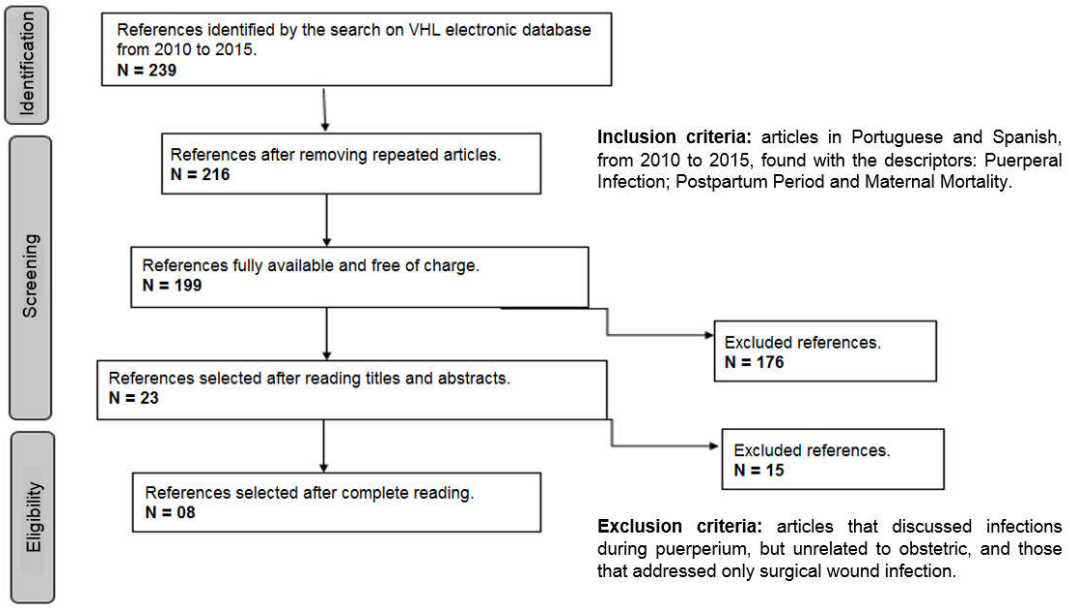

Figure 1. Schematic representation of the methodology

Table 1. Distribution of bibliographic data regarding the analysis of the information from the selected articles, 2016

Study (authors)	Year	Journal	Country	Language	Method	Synthetic definition
Filho *et al.,*	2010	Revista Brasileira de saúde Materno Infantil	Brazil	Portuguese	Cross-sectional cut.	They identified 35 cases of puerperal sepsis of genital origin. The majority came from inner cities, primiparous and had been submitted to cesarean section. 42.8% of them presented temperature values below 35ºC or above 37.8ºC. Complications occurred with 45.7%. Hysterectomy was performed in 44.1% of the patients, requiring relaparotomy in 54.3%.
Benincasa *et al.,*	2012	Revista HCPA	Brazil	Portuguese	Retrospective cohort, of observational character.	A high cesarean rate was observed in the service during the investigated period. The rate of infection after cesarean deliveries was 2.8%, and 0.8% after vaginal deliveries.
KuchenbeckER; Santos RP; Seligman BGS.	2012	Revista HCPA	Brazil	Portuguese	Literature Review.	The investigation of three articles addressing healthcare-related infections showed that the rate of puerperal infection is associated with surgical delivery. Therefore, reducing cesarean sections will reduce infections.
Paiva *et al.,*	2012	Revista da Associação Medica Brasileira	Brazil	Portuguese	Prospective study.	Maternal obesity at the end of pregnancy in high-risk patients is associated with the occurrence of infectious complications in the puerperium.
García OS	2013	Revista Peru Med Exp Salud Publica	Peru	Spanish	Literature Review.	Puerperal fever is a disease that became epidemic in the 18thcentury resulting from urbanization and its consequences arising from the industrial revolution, progressive hegemony and medicalization of large public childbirth hospitals. The more interventionist measures adopted, the greater the number of maternal deaths.
Soares *et al.,*	2013	Revista Brasileira de Ginecologia e Obstetrícia	Brazil	Portuguese	Quantitative, descriptive and cross-sectional cut.	In the reference hospitals for high-risk pregnancy, the main causes of maternal death were: pre-eclampsia/eclampsia, urinary tract infection, puerperal infection and indirect causes. In the ones reference to low-risk gestation, they were hemorrhages, embolisms and anesthetic complications.
Lima *et al.,*	2014	Cogitare enfermagem	Brazil	Portuguese	Descriptive research, with qualitative approach.	The risk factors for infection in the surgical puerperium by applying the Carraro Care model are: obesity, altered psychological state, skin and/or mucosal injury, impaired immunity, insufficiency in one or more organs and the use of prosthesis.
Filho *et al.,*	2010	Rev Med Minas Gerais	Brazil	Portuguese	Case report.	To describe a case of post-cesarean infection in a 20-year-old puerperal patient who developed septic shock following hemotransfusion.

childbirth and puerperium; eclampsia and gestational hypertension with significant proteinuria; postpartum hemorrhage; puerperal infection; premature separation of placenta (Ferraz; Bordignon, 2012). Nevertheless, in 2011, the Brazilian Federation of Gynecology and Obstetrics (2011) issued guidelines for prevention of puerperal infection and maternal mortality, which state that puerperal infection has become the main cause of maternal deaths. In view of these considerations, Van (2013) statedin his study that puerperal infection is a general term used to describe bacterial growth in the pelvic region developed in postpartum. In most cases, the bacteria responsible for the infection are those who normally reside in the intestine and also colonize the perineum, vagina and cervix. Postpartum infections often happen and endanger maternal life and health. Internationally, puerperal infections present indexes that oscillate between 3% and 20%. In Brazil, studies indicate that these parameters are between 1% and 7.2% (Cruz *et al*., 2013).

Researches on this theme reinforce that the problem is even more common in patients with preexisting genital infection or from lower classes, in which malnutrition and obesity are not rare (Paiva *et al*., 2012). The main risk factors include amniorrexe and/or prolonged labor, malnutrition or obesity, excessive vaginal manipulation, surgical trauma, poor conditions of asepsis, cesarean section, immunological weakness, unfavorable socioeconomic levels and retention of ovular remains. In addition to puerperal infection increased by cesarean delivery, the incision can be infected (Benincasa *et al*., 2012). A study by Martins (2010) in the state of Pernambuco revealed that, after analyzing 77 women with puerperal infection, 68.6% of the sample had undergone cesarean section, showing the great use of this route of delivery. Corroborating, another research involving 244 patients met for puerperal infection treatment showed that most people were in their first pregnancy (73.6%), and the most frequent birth was caesarean, performed in 51.9% of them (Gois *et al.,* 2012).

Epidemiological evidence shows that Brazil lives an epidemic scenario of cesarean sections performed in an unnecessary and unwanted form. The expansion of women's autonomy in their pregnancy and childbirth process appears as a possibility to confront this reality, being able to reduce obstetric complications, especially infection, which can result in puerperal morbidity and mortality (Leão *et al.,* 2013). For Vânia Muniz Néquer Soares (2012), puerperal infection is about three times higher iat high-risk hospitals than the other group, which may be associated with high rates of cesarean occurring at those hospitals. Inserted in this context, in 2011, the Stork Network (*Rede Cegonha*) was created, a network of care that ensures women the right to reproductive planning, humane attention to pregnancy, childbirth and puerperium, and to children, the right to a safe birth, healthy growth and development, culminating in the deployment of systematization of obstetric and neonatal assistance throughout the country, as a way to strengthen the policy of humanization of assistance to women's health.

Brazilian cesarean reality

The current high rates of caesarean section are worrisome, especially in developing countries. In Brazil, this surgical procedure rates vary widely among regions, especially when comparing the assistance performed by UHSto private assistance.

Regarding supplementary health, there has been an incidence of 80%, whereas in the UHS, it is close to 30% (Amorim; Souza; Porto, 2010). Brazil is one of the countries with the highest incidence of cesarean sections in the world and features a growing increase of cesarean births since the 70's. Brazilian rates currently exceed the recommendations of the World Health Organization of a maximum rate of 15% of cesarean sections for any country (Who, 2015). For Amorim et al.(2010), actual indications of cesarean sections are shoulder presentation; genital herpes with active lesion; cord prolapse with incomplete dilation; premature separation of placenta; partial or total placenta praevia; and vasa praevia rupture. The same authors also consider some indications: fetal weight above 4,5kg associated with maternal diabetes; woman with HIV and unknown viral load or above 1,000 copies after the 34thweek of pregnancy; dystocia of progression, after attempting to solve its main cause, with the use of oxytocin and/or artificial rupture of membranes;cephalopelvic disproportion, visualized through partogram; fetus malposition, after attempt to rotate the cephalic pole, andcases of non-evolution of labor, after using misoprostol and/or vesical delay probe and oxytocin. Hospital managers and professionals must analyze the severe morbidity, maternal deaths and the rate of used procedures, often improperly, such as cesarean section, anesthesia and episiotomies, among others, as a priority strategy to reduce avoidable maternal deaths. Post-cesarean infections are cause of great maternal morbidity and mortality (Soares *et al.,* 2012).

FINAL THOUGHTS

The analyzed publications indicate a higher incidence of puerperal infection in women undergoing cesarean surgery, which arouses concern for promotion, growth, spread and development of a critical awareness of health professionals for indication of abdominal delivery route when, indeed, necessary. Furthermore, other risk factors could be identified, such as obesity, socioeconomic conditions, premature amniorrexe and poor hygiene conditions. The national literature still diverges whether the leading cause of maternal death results from preeclampsia/eclampsia or puerperal infection. Thus, multi-centre studies with national scope should be developed for better evaluation of that information. Moreover, Brazilian literature still lacks studies on puerperal infections.

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