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## INTEGRATIVE REVIEW

Fatores predisponentes para infecção da ferida operatória pós-cesárea: uma revisão integrativa

Risk factors for wound infection after cesarean section: an integrative review

Factores de riesgo a infección de la herida quirúrgica después de la cesárea: una revisión integradora documental

Isis Cristiane Bezerra de Melo Carvalho <sup>1</sup>, Nilba Lima de Souza <sup>2</sup>, Angélica Teresa Nascimento de Medeiros <sup>3</sup>

### ABSTRACT

**Objective:** to study the predisposing factors that interfere with the emergence of infection in surgical wound after cesarean section. **Method:** It is an integrative review about the predisposing factors for infection of the surgical wound after cesarean section. It has as guiding question, which is the scientific production in the last five years about the predisposing factors for infection of the surgical wound after cesarean section? **Results:** We found five publications, which showed the main predisposing factors for infection: obesity, diabetes, low socioeconomic status, duration of labor and premature rupture of membranes. **Conclusion:** The subject is little explored in the scientific world and in the studies analyzed, concern over use of antibiotic therapy was superior to the conditions, which concern the pre, intra and postoperative great. **Descriptors:** Infection, Puerperal infection, Surgical wound infection and caesarean section.

### RESUMO

**Objetivo:** estudar os fatores predisponentes, que interferem no surgimento da infecção em ferida operatória pós-cesárea. **Método:** trata-se de uma revisão integrativa sobre os fatores predisponentes para infecção da ferida operatória pós-cesárea. Tem como questão norteadora qual a produção científica nos últimos cinco anos acerca dos fatores predisponentes para infecção da ferida operatória pós-cesárea? **Resultados:** encontramos cinco publicações, que apontaram como os principais fatores predisponentes para a infecção: a obesidade, diabetes, baixo *status* socioeconômicos, duração do trabalho de parto e ruptura prematura de membranas. **Conclusão:** O assunto é pouco explorado no meio científico e, nos estudos analisados, a preocupação com uso da antibioticoterapia foi superior às condições, que concernem ao pré, trans e pós-operatório ótimo. **Descritores:** Infecção, Infecção puerperal, Infecção da ferida operatória, Cesárea.

### RESUMEN

**Objetivo:** estudiar los factores predisponentes, que interfieren en el surgimiento de la infección en herida operatoria pos-cesárea. **Métodos:** se trata de una revisión integrativa sobre los factores predisponentes para infección de la herida operatoria post-cesárea. Tiene como pregunta guiadora ¿cuál es la producción científica en los últimos cinco años acerca de los factores predisponentes para infección de la herida operatoria post-cesárea? **Resultados:** encontramos cinco publicaciones, que apuntaran como los principales factores predisponentes para la infección: la obesidad, diabetes, bajo *status* socioeconómicos, duración del trabajo de parto y ruptura prematura de membranas. **Conclusión:** El asunto es poco explorado en el medio científico y, en los estudios analizados, la preocupación con uso de la terapia antibiótico fue superior a las condiciones, que conciernen al pre, trans y post-operatorio óptimo. **Descriptor:** Infección, Infección puerperal, Infección de la herida operatoria, Cesárea.

<sup>1</sup> Nurse, graduate in Nursing by the Federal University of Rio Grande do Norte. Substitute Teacher of the Nursing School of Natal of the Federal University of Rio Grande do Norte. Natal/RN, Brazil E-mail: isiscbm@yahoo.com.br. <sup>2</sup> Doctorate Professor of the Nursing Department of the Federal University of Rio Grande do Norte. Natal/RN, Brasil. E-mail: nilbalima@ufrnet.br <sup>3</sup> Master degree in Nursing by the Federal University of Rio Grande do Norte. Substitute Teacher of the Nursing School of Natal of the Federal University of Rio Grande do Norte. E-mail: angelmedeiros2001@yahoo.com.br.

## INTRODUCTION

**H**ealthcare Related Infection (IrAS) is that acquired during the period of hospitalization and was not present or was in incubation period on the occasion of the admission of the patient. It is usually diagnosed from 48 hours after admission. The term "nosocomial infection" is being replaced by Healthcare Related Infection (IrAS), for being more complete and better reflect the risk<sup>1</sup>.

According to Lopes, in recent years it was found that in hospitals there has been an increase in the prevalence of resistant bacteria. This finding is worrying, because, if the bacteria are resistant to all existing microbial agents, ceases to exist with which to treat patients. Resistance to these drugs has occurred since the beginning of its use by humans, with progressive resistance of bacteria to these substances<sup>3</sup>.

Referring to infection in surgery, it is considered as an enormous health problem those that occur as complications of surgery committing the incision and/or the cavity operated, representing 24% of the IrAS, that approximately 8% occur in cesarean sections, constituting the most important infectious reason of maternal death<sup>4</sup>.

The infection in surgical place generates negative impact to client's life, bringing up undesirable feelings, caused by doubts about the realization of the curative, by changes in body image, by fear of non-healing lesion, plus other bio-psychosocial impacts such as increased length of stay, pain, fever, family space separation and delay of return to work<sup>5</sup>.

In relation to obstetrical surgery, surgical delivery is a procedure indicated when some kind of risk to the mother, the baby, or both, in order to save their lives<sup>4</sup>. However, the realization of cesarean section in Brazil reached 82.3% rate in the private sector and of 33.25 in the Unified Health System (SUS), when the recommendation of the World Health Organization (WHO) is 15%<sup>6</sup>.

It is known that the surgical delivery provides increased risk of infection and greater number of complications when compared to natural childbirth. This reality was confirmed in a study related to maternal complications with 1748 pregnant, in which was found a total of 56.5% of complications in cesarean section and 43.5% in natural childbirth<sup>7</sup>.

Post-cesarean surgical infection is defined as wound infectious inflammatory process or operated cavity that drains purulent secretion, with or without positive culture. It can be limited to incision, with presence of hyperemia and edema, or involved adjacent structures to the wound, i.e. other tissues that were exposed or manipulated during surgery<sup>8</sup>.

Surgical childbirth favors puerperal complications being a predisposing factor to raise the risk of endometritis bacteremia, abscess or pelvic thrombophlebitis and death by infection<sup>9</sup>.

On the relevance of investigating the factors that favor the puerperal infections, especially those relating to surgical delivery, the present study aimed to investigate, in the literature pertinent to the topic, the predisposing factors for infection of the surgical

wound post-cesarean section, over the past five years. Its implementation is justified by the negative impact on puerperal period of women in recovery, compromising the satisfactory puerperal involution, prolonging the time of hospitalization and slowing the bond mother/infant and family. The study also provides an overview of existing publications with reflections and improvement of knowledge about the scope of the factors favoring the surgical wound post infections to enhance the process of nursing care, focused on prevention of this type of injury.

## METHOD

It is an integrative review of qualitative nature. The option for integrative review was based on the fact that she has the purpose to collect and summarize results of research on a particular issue, making readers obtain deeper knowledge about the subject<sup>10</sup>. Also contributes to the development of theory and has direct applicability to practical conduct<sup>11</sup>.

For the integrative review can be established, it is necessary to traverse six distinct steps<sup>12</sup>. The first step was to set the guiding question: what are the factors that favor the triggering of surgical wound infections post-cesarean, singled out in the past five years, relevant to the topic in the literature? The intention to make this cut of five years is due to the fact the microorganisms living in hospitals are mutables, multidrug-resistant to some antibiotics and hospital bacterial flora present in constant change. However it is believed that, in a period corresponding to the last five years, there has been less variability in microbial profile and behavior of these coping hospital microorganisms. The key words used were "infection", "puerperal infection, infection of the surgical wound" and "cesarian section".

In the second stage were established the following inclusion criteria: articles published in the last five years, which are related to predisposing factors for infection of the surgical wound post-cesarean section available in the selected databases. Exclusion criteria were: articles that do not present the full text and access restricted, at risk of not present in the data abstracts consistent with variables defined for the purpose of this study and the impossibility of analysis and interpretation of the results presented in them; articles that are duplicates in the database, and found items from the selected key words, but not related to the purpose of the study, as well as letters to the editor and editorials.

In the third step was built an instrument protocol type that served as a guide for selection of the studies included in this review, having regard to the purpose of the study, previously defined to perform the search in the literature, because it ensured that the criteria were not based on the results of the studies<sup>13</sup>, thus, the protocol used, defined the cutting time of publication of studies, in order to obtain more updated data on the subject studied and the following variables: authors/year, objectives, main risk factors for infection of the surgical wound and conclusions.



The fourth step corresponded to the analysis, evaluation and selection of the studies found. The literature survey was conducted during the period from 09.09.2012 to 09.12.2012, when every day was held to full search in a database. 5223 publications were selected, then the critical evaluation of these studies was done, which resulted in the selection of five publications.

Later as fifth stage, analysis of selected articles were done and as sixth stage data and presentation of the results, which will be exposed further.

During the search for studies in Pubmed, we used the crossing and English descriptors, which developed the following form. The first crossing of descriptors used was: *infection* (and) *puerperal infection* (and) *surgical wound infection*, where arose three articles and, according to the inclusion criteria, did not meet the study. The second crossing was performed with the descriptors: *puerperal infection* (and) *surgical wound infection* (and) *cesarean section*, being found 123 articles; and two studies were selected which, when analyzed carefully, responded to the questions of the proposed study. And the third crossing contemplated the descriptors *infection* (and) *cesarean section* (and) *surgical wound infection*, emerging 14 articles, but not responded to the object of study.

In the Lilacs database, the search occurred the same way in Pubmed, including the order of descriptors however the search occurred in Portuguese. At the first crossing we did not find articles on the second crossing emerged four articles, but only an article contemplated the criteria proposed. And in the third crossing we did not find articles.

In the Cochrane Library database, the search has developed with the individual descriptors and in Portuguese: to "infection" we found 76 articles, of which an article contemplated the object of study; "for puerperal infection", seven articles, for "cesarian section", 67 articles, and for "surgical wound infection", 37 articles, however they did not correspond to the desirable criteria.

In the Scielo database, the search was conducted in the same way as in the Cochrane Library: 4620 found articles with first descriptor, 21 articles with the second descriptor, 180 articles with the third descriptor and 71 articles with the fourth descriptor. However only with the second descriptor we found an article that contemplated the proposed criteria.

## RESULTS AND DISCUSSION

For best presentation of the results of this research, we chose to present them considering authors and year of publication, objective, major risk factors found in these studies that favored the infection of the surgical wound post-cesarean section and conclusions. These results are presented in table 1.

Table 1 - Characterization of the analyzed studies, about the year, authors, objectives, key results and conclusion

Authors/Year	Objetive	Major risk factors for infection of the surgical wound	Conclusions
Tita, Rouse, Blackwell, Saade, Spong, Andrews; 2009	To check the current <i>status</i> of antibiotic prophylaxis for cesarean section, and the recent development strategies to improve the effectiveness of antibiotic prophylaxis in reducing post-cesarean section infection and the implications of emerging practices.	The incidence of post-cesarean infection varies widely by population profile that depends on several risk factors, such as low socio-economic <i>status</i> , fetal emergency and obesity.	Use of antibiotics before cesarian section procedure has been demonstrated to be more effective than the administration immediately after the clamping of the umbilical cord.
Dinsmoor, Gilbert , Landon, Rouse, Spong, Varner et al; 2009	Estimating the effectiveness of antibiotic prophylaxis at the time of caesarean section for reducing the complications of postpartum infection.	The duration of labor and rupture of the membranes are associated with an increased risk of postpartum infection in women undergoing caesarean section.	Use of antibiotics before the woman starts labor significantly reduced the risk of postpartum endometritis and wound infection.
Filho, Linhares, Machado, Guimarães, Azevedo, Costa; 2010.	The report describes the infection in 20 years who has recently given birth of post-cesarean section, which evolved with septic shock, after administration of blood transfusions.	The presence of vascular chronic diseases, perioperative not great conditions, obesity, <i>diabetes mellitus</i> , chorioamnionitis, administration of corticosteroid therapy, stress,	Post-cesarian infections are cause of great maternal morbidity and mortality. They are essential to reduce them, the pre, peri and post-operative.

		<p>nutrition, hypothermia, smoking, premature rupture of membranes and time of labor, cervical dilation, treatment for fertility and twin pregnancy.</p>	
Paiva, Nomura, Dias, Zugaib; 2012	To analyze the association between maternal obesity and infectious complications of the puerperium in high-risk pregnancies.	Obesity at the end of pregnancy was associated with significantly to surgical wound infection.	Association between obesity and postpartum infectious complications demonstrated the need for better guidance pre-conceptual, so women get pregnant in best nutritional conditions, as well as the adoption of preventive measures, in order to not change the nutritional classification with the course of pregnancy.
Justus, Fiona; 2008	To assess the effects of prophylactic antibiotic treatment in infectious complications in women undergoing caesarean section.	Emergency cesarian section, duration of labor, time of rupture of the membranes, low socioeconomic <i>status</i> , number of pre-natal consultations, vaginal touch during labor, urinary infection, anemia, blood loss, obesity, diabetes, and operator expertise of operative technique and general anesthesia.	Reduction in wound infections justifies a policy of recommending prophylactic antibiotics for women undergoing elective and non-elective cesarean section.

The articles have been classified as: an integrative review, quantitative original research of prospective type, a case study, an observational prospective study and a systematic review. The year of publication ranged between 2008 and 2012.

Of the five studies, four of them agreed that obesity is a predisposing factor for the infection of the surgical wound postpartum<sup>14,16,17,18</sup> being this factor associated with ineffective tissue circulation, greater accumulation of seroma and bruising. In addition to the presence of subcutaneous tissue with more than two centimeters associated with higher probability of operative wound dehiscence<sup>16</sup>.

The prolonged labor and premature rupture of membranes were cited in three studied publications<sup>15,16,18</sup>. It was observed that, in patients in labor with indication of caesarean section, there is increased probability of infection, when it is prolonged and it has rupture of membranes before surgery, in addition to being associated with the excessive number of vaginal touches<sup>16,118</sup>.

Low socioeconomic *status* was quoted in two publications<sup>14,18</sup>, however none of the two studies related the reason for this factor to be related with the infection of the surgical wound post-cesarean. It is believed that factors related to the condition of food can influence the immunity of women, as well as the conditions of hygiene, compromised when women are exposed to low socioeconomic conditions. Other factors cited by two of the studies were perioperative not great conditions and the skill of the operator and surgical technique, in addition to the mellitus diabetes, because during the first 24 hours the presence of blood glucose below 200 mg/dl are associated with lower risk of infection<sup>16,18</sup>.

Other additional aggravations factors were: fetal emergency, chronic vascular conditions, chorioamnionitis, corticosteroid administration, stress, nutrition, hypothermia, smoking, treatment for fertility, twin pregnancy, emergency Cesarean delivery, number of pre-natal consultations, vaginal touches during labor, urinary infection, anemia, blood loss and general anesthesia<sup>14,16,18</sup>.

It is noticed that there is concern about the use of antibiotics before, during or after the surgery, the spectre and the type as favorable factors for prophylaxis of surgical infections.

It is worth mentioning that only one publication cited the importance of optimum conditions during the pre, trans and post-operative to the decrease of surgical wound infection in post-cesarean after all the isolated antibiotic is not the only solution, or more important for the reduction of post-surgical infectious.

## CONCLUSION

Predisposing factors to the emergence of infection in surgical wound post-cesarean is still an unexplored subject in the scientific world in the past five years, but among the most cited factors analyzed studies were obesity, prolonged labor and premature rupture of membranes. It is necessary to emphasize the concern of authors such as use of antibiotics,



which was exceeding the requirements, which concern the pre, trans and post-operative, whichever is the use of antibiotic prophylaxis.

With that, relevant further investigation about the factors that contribute to the onset of infections in surgical wound post-cesarean, so that the care provided to women in puerperal period are carried out securely, in order to reduce maternal morbidity and mortality caused by this event.

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Contact of the corresponding author:  
Isis Cristiane Bezerra de Melo Carvalho  
Rua Adeodato José dos Reis, Nº50. Condomínio Jangadas, Bloco 16, ap.306  
Bairro: Nova Parnamirim. Cep:59152-820 Parnamirim RN.  
E-mail: isiscbm@yahoo.com.br.