

# Obstetric History and Maternal Complications Related to Preterm Birth

ORIGINAL

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## Abstract

**Objective:** To summarize knowledge produced in scientific articles about obstetric history, maternal complications and types of pregnancy as risk factors related to preterm birth.

**Method:** An integrative review conducted in February and March 2015, through databases: lilacs, CINAHL and Pubmed. For this it was used the Mesh descriptors: Infant, premature; Risk factors and Causality, having been found studies 50, 528. After assessment of methodological rigor and level of evidence of the studies 32 articles were selected.

**Results:** Among the risk factors associated to preterm birth highlighted the previous history of prematurity. Also emerged: hypertensive disease by eclampsia and eclampsia no, genitourinary infection and antiretroviral therapy in pregnancy.

**Conclusion:** Maternal complications are subject to screening, treatment and prevention. In addition, obstetric history of risk can be identified in a timely manner to reduce morbidity and mortality both mother and neonatal.

## Introduction

Preterm birth, less than 37 weeks of pregnancy, is considered a problem of public health worldwide. That is because preterm birth is considered one of main risk factors for neonatal morbidity and mortality. [1]

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## Keywords

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Prematurity is responsible for 14% of the causes of child deaths in the world<sup>1</sup>. In addition, amount of preterm and low birth weight infants at birth has increased steadily in recent decades. Complications of preterm birth are a major cause of global neonatal deaths. In addition, number of preterm and low birth weight infants at birth has increased steadily over recent decades. Overall 11.1% of babies are born preterm equivalent to more than 15 million children or more than 1 in 10 children. In this regard more than 60% of births occur in Africa and South Asia, however, the 10 countries with the highest rates include Brazil, the USA India and Nigeria. [2, 3, 4]

Additionally, preterm birth cause clinical consequences that require care more complex and sometimes throughout life. These types of repercussions result in a high social and economic cost to countries because preterm birth arises from a set of interrelated factors. Such factors impact upon quality of life of those who survive bearing sequels or repercussions in infant mortality [5].

This reality has aroused concern regarding the quality of prenatal and postpartum care. This concern is justified given that the fetal growth and development are important predictors of child health. Furthermore, predictors also relate to the health status in adult life [6-7]. So, it is essential the early identification of risk factors for the birth of premature baby.

Thus, following research question has emerged: What is production of scientific knowledge on obstetric history, maternal complications and types of pregnancy as risk factors related to preterm birth? Thereby, present study aims to synthesize knowledge produced in scientific articles on obstetric history, maternal complications and types of pregnancy as risk factors related to preterm birth.

## Method

This study is an integrative review carried out in five steps: identification of guiding research ques-

tion, search of literature in databases, evaluation of the documents concerning methodological rigor, data analysis and presentation of results. Such steps intended to develop scientific knowledge synthesis on: obstetric history, maternal complications and types of pregnancy as risk factors related to preterm birth. Allied to the synthesis also carried out there was purpose of incorporating applicability of results of significant studies in developed practice [8].

To perform integrative review, two investigators conducted searches in databases during the months of February and March 2015. Databases used were: LILACS (Literatura Latino- Americana e do Caribe em Ciências da Saúde), CINAHL (Cumulative Index to Nursing and Allied Health Literature) and Pubmed.

This quest found 50, 528 studies by using following descriptors MESH (Medical Subject Headings): Infant, premature; Risk factors and Causality. After crossing these descriptors, by Boolean operator "AND", following data resulted: Infant, premature "AND" Risk factors "AND" Causality (115 lilacs, pubmed 8534, CINAHL 01); Infant, premature "AND" Risk factors (lilacs 430, 10398 Pubmed, CINAHL 1584); Infant, premature "AND" Causality (lilacs 444, 29020 Pubmed, CINAHL 03).

Regarding the time frame it were selected studies published since 2006. It is justified this time period considering that it provides evaluation of scientific production and of current reality of the risk factors for preterm birth. Then it was proceeded by reading titles and abstracts applying the inclusion criteria: full articles electronically available and free in selected databases of capes periodic portal; published in Portuguese, English and Spanish; beyond that addressed the topic under study.

In addition, it was adopted exclusion criteria described below: letters to the editor; editorials; literature review and integrative review, cross-sectional studies, qualitative studies, which presented secondary data and/or those who did not include the theme of the present integrative review.

The extent that these eligibility criteria were applied, repeated articles were counted only once. Full texts of these studies were transferred and stored on the computer. After these steps, complete

**Table 1.** Levels of evidence [9] classified in description of studies. Natal, Brazil, 2015.

Level of evidence	Methodological design	Strength of evidence
I	Evidence originated by systematic reviews or meta-analysis of relevant clinical trials	High
II	Evidence derived from at least one randomized controlled clinical trial well outlined	High
III	Clinical trials well designed no randomization	Moderate
IV	Cohort studies and case-control well designed	Moderate
V	Systematic review of descriptive and qualitative studies	Moderate
VI	Evidence derived from a single descriptive or qualitative study	Low
VII	Opinion of authorities or experts committees report	Low

**Source:** Research data

reading of these articles was conducted by considering: methodological rigor regarding clarity of the trajectory of the method; identifying limitations and bias; evidence level for the selection and presentation of results. Whole process resulted in 32 articles (02 CINAHL, 09 LILACS, 21 of pubmed).

Thus, these articles were organized in framework containing: identification of studies, year of publication, objective, methodological design, level of evidence and place of study. Regarding level of evidence [9] studies were classified according to **Table 1**. Moreover, risk factors related of preterm birth; maternal reproductive history; maternal complications during pregnancy and type of pregnancy were presented descriptively and analyzed based on of the relevant literature.

## Results

**Table 2** shows description of the 32 studies that present risk factors related to preterm birth. It is observed predominantly in evidence IV level that is considered moderate level which corresponding to methods of Cohort and case-control. In addition, only eight of these studies were done in Brazil.

**Table 2.** Characterization of articles according to year of publication, study objective, method, level of evidence and place of study. Natal, Brazil, 2015.

Id	Year of publication	Study objective	Method	Level of evidence	Place of study
1A [10]	2014	To determine whether there is a correlation to preterm labor and vaginal microbiota during pregnancy	Cohort study	IV	United States
1B [11]	2013	To investigate whether women who previously presented abortion or termination of pregnancy have an increased risk of spontaneous preterm birth	Cohort study	IV	Europe
1C [12]	2013	To estimate the range of possible birth outcomes associated to untreated syphilis during pregnancy	Systematic review	V	United States
1D [13]	2013	Identify whether there is an association between preterm birth and use of antiretroviral drugs in pregnancy	Cohort study	IV	United States
1E [14]	2013	To examine the association between intimate partner violence and preterm birth	Case-control study	IV	Australia

Id	Year of publication	Study objective	Method	Level of evidence	Place of study
1F [15]	2012	To identify whether the use of herbal products during pregnancy is very common and whether everyday use of almond oil spread in the skin is associated with premature birth	Cohort study	IV	Italy
1G [16]	2012	To investigate the association between sociodemographic data and obstetrical risk factor in preterm birth in five hospitals of Maternal and Child Health in Beijing, China	Case-control study	IV	China
1H [17]	2012	To investigate whether there is an association between use of antiretroviral combination therapy during pregnancy by women infected with HIV and risk of prematurity	Cohort study	IV	France
1I [18]	2012	To analyze determinants of low birth weight, small for pregnancy and premature births in Lombok, Indonesia	Randomized clinical trial	II	Indonesia
1J [19]	2012	To determine the genitourinary infections as risk factors for preterm birth in teenagers	Case-control study	IV	Mexico
1K [20]	2012	To analyze the risk factors for preterm birth in the city of Campina Grande, State of Paraiba, Brazil	Case-control study	IV	Brazil
1L [21]	2011	To determine the bio-psycho-social risk factors for preterm birth in a sample of Turkish women without chronic diseases and evaluate their anxiety and depression in early postpartum period	Case-control study	IV	Europe
1N [22]	2011	To investigate whether in utero exposure to antiretroviral therapy is associated with low birth weight and / or premature birth in a population of South African women who advanced HIV disease	Cohort study	IV	Africa
1° [23]	2011	To examine the associations between systolic and diastolic blood pressure in different trimesters of pregnancy and both fetal growth characteristics measured repeatedly and risks of adverse birth	Cohort study	IV	Holand
1P [24]	2011	To investigate whether the use of highly active antiretroviral therapy (HAART) during pregnancy has been linked to premature births	Randomized clinical trial	II	United States
1R [25]	2011	To analyze the relationship of gestational Malaria and its effects in newborns in a region endemic for malaria in Colombia between 1993 and 2007	Cohort study	IV	Colombia
1S [26]	2011	To evaluate the relationship between presence of Chlamydia trachomatis and placenta signs of inflammation in women who gave birth at 32 weeks gestation or less	Cohort study	IV	Holand
1T [27]	2011	To evaluate the risks of preterm delivery and hypertensive disease specific to pregnancy among pregnant women with mood disorders and migraine	Cohort study	IV	United States

Id	Year of publication	Study objective	Method	Level of evidence	Place of study
1U [28]	2010	To evaluate effects of non-surgical treatment of periodontal disease during second trimester of pregnancy on adverse pregnancy	Clinical trial	III	Brazil
1V [29]	2010	To determine whether there are differences in risk factors for preterm birth in different income levels	Cohort study	IV	Brazil
1X [30]	2010	To evaluate periodontitis of moderate to severe in pregnant as risk factors for prematurity, premature rupture of membranes and low birth weight	Cohort study	IV	Argentina
1Y [31]	2010	To evaluate relationship among housing conditions and low birth weight and prematurity associated to low birth weight in children of low-income women	Case-control study	IV	Brazil
1Z [32]	2009	To relate maternal exposure to risk factors for preterm births at the Hospital Nossa Senhora da Conceição, in Tubarão (SC), from June to November 2008	Case-control study	IV	Brazil
1W [33]	2009	To point out factors associated with preterm birth in a hospital in the city of Londrina, Parana State,	Case-control study	IV	Brazil
2A [34]	2008	To evaluate whether domestic violence during pregnancy is related to unfavorable infant health, measured by low birth weight or prematurity	Cohort study	IV	Brazil
2C [35]	2008	To evaluate periodontal disease as a risk factor for low birth weight premature	Case-control study	IV	Turkey
2D [36]	2008	To investigate whether endothelial dysfunction as assessed by high cell fibronectin (CFn), in women with pre-eclampsia is associated with an increased risk of preterm	Case-control study	IV	United States
2E [37]	2007	To identify risk factors associated to birth of newborns very low birth weight in the Hospital Geral de Caxias do Sul, Rio Grande do Sul, Brazil	Case-control study	IV	Brazil
2F [38]	2007	To determine association between maternal body mass index and risk of preterm delivery	Case-control study	IV	Scotland
2G [39]	2007	To investigate the role of genetic variation of progesterone receptor gene (PGR) in modulating risk for preterm labor, examining maternal and fetal effects	Case-control study	IV	United States
2H [40]	2007	Measure the risk of premature labor, premature rupture of membranes, low birth weight and infant mortality associated to Chlamydia	Cohort study	IV	United States
2I [41]	2006	To identify factors associated to pregnant women with diagnoses of preterm	Case-control study	IV	Spain

Source: Research data

**Table 3.** Risk factors of preterm birth according to categories. Natal, Brazil, 2015.

Categories	Risks Factors Related To Preterm Birth
Obstetric history	Previous history of prematurity [16, 20-21, 29, 31-34, 42]
	High blood pressure [29, 37]
	Reproductive abnormalities [16]
	Primiparity [29]
	Two to four previous miscarriages [11]
	Reproductive history assisted [33]
	Previous child of low birth weight [37]
	Nulliparous with morbidly obese [38]
Maternal complications	Hypertensive disease with eclampsia and no eclampsia [16, 20, 27, 33]
	Preeclampsia [23, 36, 41]
	Genitourinary infection [19, 21, 32-33]
	Vaginal bleeding [20, 32-33]
	Bacterial vaginosis [10, 32, 35]
	Antiretroviral therapy in pregnancy [13, 17, 22, 24]
	Periodontal disease [28, 30, 35]
	Altered amniotic fluid volume [20, 33]
	Premature rupture of membranes [41]
	Placenta previa [16]
	Chlamydia [26, 41]
	Maternal syphilis [12]
	Malaria [25]
	Pyelonephritis [32]
	Gestational diabetes mellitus [16]
	Pregnant women infected by HIV [17]
	Diarrhea [18]
	Edema [18]
	Maternal physical injury [20]
	Antepartum haemorrhage associated to intimate partner violence [14]
Herbal consumption (Almond oil, chamomile and fennel) during pregnancy [15]	
Genetic variation in progesterone gene [39]	
Type of pregnancy	Twin pregnancy [32-33, 41]

**Source:** Research data

**Table 3** shows risks factors related to preterm birth according to categories: obstetric history, maternal complications and type of pregnancy. Among factors stood out prior history of preterm birth, hypertensive disease with eclampsia and no eclampsia, genitourinary infection and antiretroviral therapy in pregnancy.

## Discussion

Results presented that only 8 of the 32 studies were carried out in Brazil. methodological design of Cohort study and case-control was the best and both present moderate level of evidence. However, the case-control method aims to identify risk factors which this study proposes.

In this search, risk factors related to preterm birth that were identified are the following: a history of preterm birth, hypertensive disease with eclampsia and no eclampsia, genitourinary infection and antiretroviral therapy in pregnancy. In addition to this are twin pregnancy, vaginal bleeding and bacterial vaginosis.

The previous history of prematurity was one risk factor associated with prematurity which appeared more repeatedly in studies under review. In the articles consulted previous prematurity was described as jointly responsible for influencing by up to 2.37 times episodes of preterm birth in subsequent pregnancies [20].

Given the risks of chronic hypertension and / or gestational for mother and baby dyad, World Health Organization (WHO) recommends a minimum of 6 prenatal consultations. Blood pressure and weight should be checked in all consultations to identify possible complications in a timely manner. [4] That is because overweight and obesity increases the risk of preeclampsia and women should preferentially point normal weight before pregnancy. [42]

Following these guidelines of WHO, the Ministry of Health (MH) of Brazil establishes the procedure for hypertensive sídromes of pregnancy according

to the classification: mild pre-eclampsia, severe pre-eclampsia, eclampsia, acute hypertension and HELLP syndrome. This classification is designed to minimize damage to maternal and child health. Specifically for eclampsia, MH recommends that in case the pregnant woman is with gestational age greater than or equal to 34 weeks she should be prepared for pregnancy termination or delivery [43].

Additionally, preterm birth can be caused by interrelated factors, such as: genitourinary infection, factors associated with premature rupture of membranes, premature labor and chorioamnionitis. Through the release of endotoxins and exotoxins arising from the urinary tract infection, it begins the process of parturition because the infection exacerbates uterine contractility and maturation of the cervix. This leads to premature birth occurs [44].

Thus, about 17% to 20% of pregnant women have clinical condition symptomatic of Urinary Tract Infection (UTI) mediated by hormones that cause glycosuria and aminoaciduria favorable to microbial growth and infections. The UTI ranges from asymptomatic bacteriuria which can progress to acute pyelonephritis, but also may develop into cystitis. Thus, the MH recommends performing urinalysis during prenatal low risk periods in the first and third trimester of pregnancy. In addition, all pregnant women with evidence of bacteriuria should be treated. This is intended to serve as a preventive measure of progression to cystitis or pyelonephritis which cause complications to the health of the mother-infant dyad [45, 46].

Even though studies suggest the Antiretroviral Therapy (ART) as a risk factor for preterm birth, MH of Brazil recommends its prescription in pregnancy as prophylaxis of vertical transmission or treatment of infection to Human Immunodeficiency Virus (HIV). This ART should be initiated after first trimester of pregnancy. That is because rate of vertical transmission of HIV without intervention stands at approximately 25.5%. Thus, it is possible to re-

duce vertical transmission through ART combined with: elective cesarean delivery; chemoprophylaxis of azidothymidine (AZT) in laboring women and newborn; besides not breastfeeding [43]. However, despite the benefit of reducing vertical transmission study indicates that antiretroviral therapy can increase the risk of pulmonary arterial hypertension in pregnant women [47].

Corroborating with other risk factors, twin pregnancy is presented as predisposition to complications such as: vaginal bleeding, congenital anomalies and preeclampsia which culminate in preterm birth and low birth weight. Thus, it is necessary to detect pathological changes of women in multiple pregnancy and to intervene in prevention of greater damages to mothers and children [48].

Therefore, early identification of women at risk of preterm delivery allows the use of strategies that may postpone occurrence of delivery till conditions are viable for the mother-infant pair. Thus, it is possible to reduce maternal and neonatal morbidity and mortality. In this sense, the Family Health Strategy (FHS) is a technological innovation not material in area of Brazilian health policy. This strategy adopts a broader concept of the health-disease through promotion, prevention, cure and rehabilitation. Therefore it can be expanded to offer assistance to people and community in an area linked to the services provided [49].

## Conclusion

The study found several risk factors related to preterm birth among which are obstetric history and maternal complications. There was emphasis in the quantitative of research on the previous history of prematurity. In addition, these articles also revealed other risk factors such as maternal complications amenable to screening, treatment and prevention.

Among complications cited are hypertensive disease with eclampsia and no eclampsia and genitourinary infections associated with premature bir-

th. Furthermore, antiretroviral therapy has also been found as a risk factor for preterm birth.

Therefore, through the synthesis of scientific knowledge produced in this study, it is expected to contribute to the knowledge of physicians and midwives of the Family Health Strategy which provide maternal and infant care. From this, there is the intention to create opportunities expanded vision to professionals so that they can identify in a timely manner women with risk factors associated to preterm birth. These professionals can then minimize complications and reduce maternal and neonatal morbidity and mortality based on scientifically supported results.

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