

Prevalence of Neisseria Gonorrhoeae Infections in Pregnant Women: A Systematic Review

Prevalência de Infecções por Neisseria Gonorrhoeae em Gestantes: Uma Revisão Sistemática

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ABSTRACT

Introduction: Pregnant women constitute an important risk group for *Neisseria gonorrhoeae* genital infections. Although most infections are asymptomatic, they can cause severe reproductive sequelae in women, making it a serious public health problem worldwide. **Objectives:** The aim of this study was identify, through a systematic review, the prevalence of this infection in pregnant women. **Methods:** A systematic review was performed with reference to MEDLINE (National Library of Medicine) where the search strategy used the following keywords: (Gonorrhea OR “*Neisseria gonorrhoeae* Infection” OR “Infection *Neisseria gonorrhoeae*” OR “Infections *Neisseria gonorrhoeae*” OR “*Neisseria gonorrhoeae* Infections”) AND Prevalence AND Pregnancy. **Results:** The studies analyzed involved pregnant women in prenatal care in several countries and it was possible verify high prevalence rates in studies involving Papua New Guinea where infection rates reached 14.2%. This study pointed out that the prevalence of *Neisseria gonorrhoeae* is higher among black women aged 25 years or less and is directly related to sociodemographic, educational, cultural factors and inequality between men and women. **Conclusion:** There is a need to implement measures for identification and prevention *N. gonorrhoeae* during pregnancy as well as cultural and structural changes so that there can be equality rights between men and women

Keywords: *Neisseria gonorrhoeae*, prevalence, pregnant women.

RESUMO

Introdução: As mulheres grávidas constituem um importante grupo de risco para infecções genitais por *Neisseria gonorrhoeae*. Embora a maioria das infecções sejam assintomáticas podem causar graves sequelas reprodutivas nas mulheres, constituindo um sério problema de saúde pública mundialmente. **Objetivos:** O objetivo deste estudo foi identificar por meio de uma revisão sistemática a prevalência da infecção por *Neisseria gonorrhoeae* em gestantes. **Métodos:** Realizou-se uma revisão sistemática tendo como referência a base de dados MEDLINE (National Library of Medicine) onde a estratégia de busca utilizou as seguintes palavras-chave: (Gonorrhea OR “*Neisseria gonorrhoeae* Infection” OR “Infection *Neisseria gonorrhoeae*” OR “Infections *Neisseria gonorrhoeae*” OR “*Neisseria gonorrhoeae* Infections”) AND Prevalence AND Pregnancy. **Resultados:** Os estudos analisados envolveram mulheres grávidas em acompanhamento pré-natal de diversos países sendo possível verificar taxas de prevalências altas em estudos envolvendo Papua Nova Guiné onde as taxas de infecção chegaram à 14,2%. Este estudo apontou que a prevalência de *Neisseria gonorrhoeae* é maior entre as mulheres negra com idade igual ou inferior a 25 anos e está diretamente relacionada a fatores sociodemográficos, educacionais, culturais e a desigualdade entre homens e mulheres. **Conclusão:** Há necessidade de implantação de medidas para identificação e prevenção de *N. gonorrhoeae* durante a gestação assim como mudanças culturais e estruturais para que possa haver igualdade de direito entre homens e mulheres. **Palavras-chave:** Higienização das mãos, Sabões, Contaminação, Infecções Relacionadas à Assistência à Saúde.

INTRODUCTION

Gonorrhea is a sexually transmitted disease (STD) caused by *Neisseria gonorrhoeae* transmitted almost exclusively through sexual or perinatal contact, with humans being the only natural host^{16,17}.

N. gonorrhoeae infections are an important public health problem worldwide, and according to the World Health Organization (WHO), every year an estimated 62 million new cases of gonorrhea occur, most of which from developing countries. In these countries, epidemiological data on sexually transmitted diseases are scarce and difficult to access and are often obtained from small numbers of patients^{18,19,28}.

Like other sexually transmitted diseases, gonorrhea is, in many cases, asymptomatic or transmitted by people who have ignored or not perceived symptoms, and can be diagnosed only with screening tests such as cultures, Gram staining and PCR, however, few countries have screening and reporting systems that allow reliable estimates of the incidence of infection^{11,20}.

Neisseria gonorrhoeae infections in pregnant women pose risks not only to the mother but also to the baby, as they can lead to several adverse outcomes including premature rupture of membranes and premature birth^{21,22}.

Despite the availability of effective antimicrobial therapy, several factors have been associated with difficult disease control in most populations, such as demographic, social, behavioral, and educational factors, where black women become more vulnerable to STDs due to complex issues, such as behavior, the social roles to be fulfilled by men and women and the relation of power between the genders^{23,24}. The aim of this study was to evaluate, through a systematic review, the prevalence of *Neisseria gonorrhoeae* infections in pregnant women.

METHODS

Research Strategies

The most relevant studies originally published in English and Portuguese between the years 2012 and 2017 were analyzed, using the MEDLINE (National Library of Medicine) database.

The search strategy used the following combinations of keywords: (Gonorrhea OR "*Neisseria gonorrhoeae* Infection" OR "Infection *Neisseria gonorrhoeae*" OR "Infections *Neisseria gonorrhoeae*" OR "*Neisseria gonorrhoeae* Infections") AND Prevalence AND Pregnancy. The inclusion and exclusion criteria for the selection of the reviewed studies are presented in Table 1.

RESULTS

A total of 807 studies involving the prevalence of *N. gonorrhoeae* were identified. However, when we selected only the studies of the last 5 years we found 113 studies directly related to the theme proposed by the review that had their titles and abstracts read for the selection of the studies reviewed. Then, we included in the review 15 studies that are represented in the flowchart below (Figure 1) where we demonstrate the selection of the articles in stages and the data used for the production of table 2.

Based on the content of the researched articles it became possible to evaluate the occurrence and distribution of *N. gonorrhoeae* in pregnant women during the last 5 years. It is possible to observe a gradual increase in the number of publications in the period evaluated, suggesting a greater concern with the consequences of *N. gonorrhoeae* infection during gestation (Figure 2).

Through the collected data it is possible to observe that a greater number of studies was developed in countries of the African continent and Papua New Guinea where the population of these countries is predominantly black.

Table 1. Criteria for inclusion, exclusion and main clinical-epidemiological outcomes.

Inclusion criteria	
Sample	• Sexually active individuals
Diagnosis	• PCR
Design	• Cross-sectional studies
Language	• Only in English and Portuguese
Exclusion Criteria	
Patients	• Inappropriate or previously diagnosed patients
Form of publication	• Abstract only
Main clinical-epidemiological outcomes	
• Prevalence of <i>N. gonorrhoeae</i> in pregnant women	
• Sociodemographic aspects	

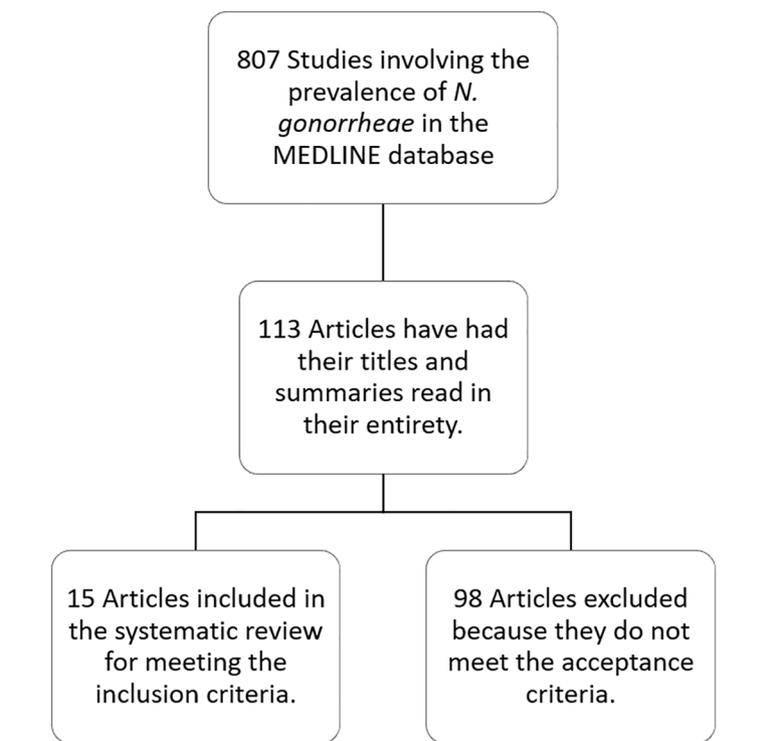


Figure 1. Study selection flowchart

Table 2. Synthesis of studies selected for review with prevalence.

Study	Sample	Country	Outcome
Moodley et al., 2017	615 pregnant women	South Africa	6.4%
Masha et al., 2017	202 pregnant women	Kenya	1.0%
Ashshi et al., 2015	84 pregnant women	Sudan	5.9%
Nateghi et al., 2017	420 pregnant women	Iran	1.6%
Vallely et al., 2016	765 pregnant women	Papua New Guinea	14.2%
Miranda et al., 2017	802 pregnant women	Brazil	0.9%
Offorjebe et al., 2017	300 pregnant women	Botswana	1.66%
Bristow et al., 2017	300 pregnant women	Haiti	2.8%
Wilson et al., 2017	338 pregnant women	U.S	1%
Chaponda et al., 2016	1086 pregnant women	Zambia	3.1%
Badman et al., 2016	125 pregnant women	Papua New Guinea	11.2%
Wynn et al., 2016	200 pregnant women	Botswana	1.5%
Wangnapi et al., 2014	400 pregnant women	Papua New Guinea	9.7%
Datcu et al., 2013	177 pregnant women	Greenland	1%
Hokororo et al., 2015	403 pregnant women	Tanzania	6.7%

DISCUSSION

The scientific production of the disease shows that, despite the fact that sexually transmitted infections can affect any individual, several demographic, social and behavioral factors influence their

prevalence, such as age, ethnicity, presence of symptoms, gender and the test used for the diagnosis is more prevalent among black women aged 25 or younger and who have multiple partners^{2, 25, 26}.

Despite the high prevalence rates of sexually transmitted infections, they have lost their importance over the last few years and

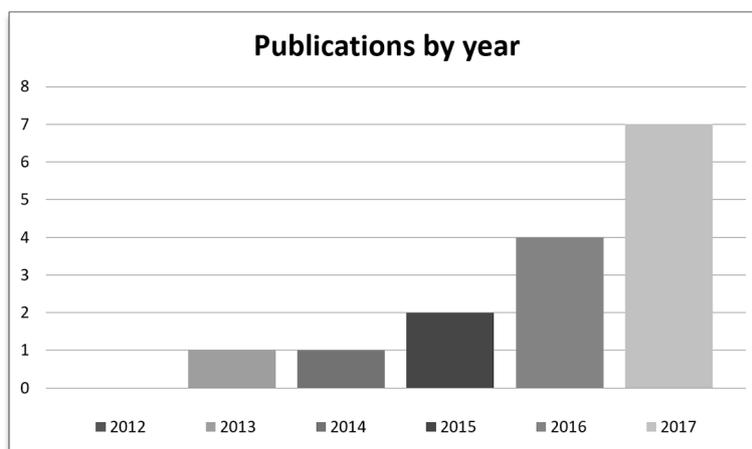


Figure 2. Disposition of articles selected for prevalence review by publication date.

again represent a serious public health problem, especially after the exponential increase in the number of HIV cases and the consequent prioritization of the treatment of this STD in particular, it is possible to observe that despite the growing number of publications there is still a lack of recent data on the prevalence of *N. gonorrhoeae* among pregnant women in different parts of the world ^{24,27}.

The diagnostic method for *Neisseria gonorrhoeae* used in the studies was the nucleic acid amplification test due to its high sensitivity and specificity, however, this is also a limitation for the correct estimation of the number of cases of *N. gonorrhoeae* because, as it is a high-cost method its use is often discarded in countries with limited resources ^{4,28}.

In populations with different risk behaviors and sociodemographic characteristics, it is possible to identify that a significant increase in the number of cases is often associated with inappropriate condom use or non-use ²⁹. Low et al., 2006 highlights that women are more vulnerable to infection primarily because of gender inequalities ²⁶.

In both developed and developing countries, women often do not have the power to insist that the partner use condoms during intercourse, especially in cases of marriage where the woman uses other contraceptive methods or during pregnancy when its use cannot be justified for family planning purposes, thus increasing the chances of women's exposure to STDs ^{13,15,30}.

The role of women in relation to sexual matters in many cases of submissiveness can be evidenced in the present study mainly on the African continent where vulnerability leads to inability to protect herself from an infected partner, causing significant damage to the sexual and reproductive health of women ^{8,23}.

Social inequality and poverty increase this lack of power, as can be observed in studies involving New Guinea, which had the highest infection rates for *N. gonorrhoeae*, reaching 14.2% in the study by Vallely et al., 2016. These high rates can be justified because of low levels of literacy, especially among women, low economic power and

the many early marriages found not only in New Guinea but also in African countries ^{2,5,11}.

Despite the high level of sexually transmitted infections among pregnant women, studies involving *N. gonorrhoeae* are limited, although this infection is considered a risk factor for adverse neonatal outcomes and may lead to the risk of prematurity, fetal losses and restricted intrauterine growth ¹. The World Health Organization (WHO) also highlights the transmission of *Neisseria gonorrhoeae* to the baby at birth, leading to ocular inflammation known as neonatal gonococcal ophthalmia, which can result in eyeball perforation and blindness ¹⁹.

Even with the current advances of the feminist movements, women still have a great disadvantage in terms of their sexual and reproductive rights, and cultural, structural and economic changes are necessary in order to achieve a true equality of rights between men and women ²³.

CONCLUSION

The evident scarcity of data on the prevalence of *N. gonorrhoeae* in pregnant women from different parts of the world shows the need to identify the real global incidence of the disease, especially among black women, thus enabling its prevention and treatment.

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