REVIEW

Prevention of Listeriosis in pregnancy: a scoping review

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Abstract

Objectives: to synthesize preventive measures against listeriosis during pregnancy as presented in the scientific literature.

Methods: a scoping review was conducted following the PRISMA-ScR guidelines. Articles were systematically searched in the PubMed/MEDLINE, SciELO, Web of Science, LILACS, and Scopus databases. Screening and data extraction were performed manually, with the support of the Rayyan® software.

Results: of 449 articles initially identified, seven were included. The main preventive measures identified were educational interventions on risks and food safety practices, consistent with health authority recommendations. However, the literature also highlights significant challenges in effectively applying these measures, particularly in adapting them to specific social and cultural contexts.

Conclusions: health education remains the primary strategy for preventing listeriosis during pregnancy. Nevertheless, its effectiveness depends on integrated actions that address sociocultural barriers, regulatory frameworks, and systematic surveillance.

key words *Listeriosis, Pregnancy, Prevention, Health education, Public health surveillance*

Introduction

The genus Listeria comprises five species of Gram-positive bacteria that primarily infect sheep, goats, and cattle.[1] However, *Listeria monocytogenes* – and, in rare cases, *Listeria ivanovii* – can also infect humans, primarily through the ingestion of contaminated food.[1]

Listeriosis usually presents with mild and self-limiting symptoms; however, this rule does not apply to pregnant women.[2] Indeed, pregnant women have up to a 100-fold higher risk of infection, with clinical manifestations that can even include severe complications such as septicemia and encephalitis.[3] Furthermore, the fetus is particularly vulnerable, with potential outcomes including miscarriage, growth restriction, and neonatal infection.[2,3]

Globally, listeriosis presents alarming epidemiological estimates.[4] Specifically, its fatality rate is estimated to range from 12% to 50% of cases, with many survivors experiencing sequelae such as ataxia and cranial nerve palsy, generating more than 150 disability-adjusted life years (DALYs).[4,5] However, in Brazil, epidemiological assessments of this condition remain scarce and superficial. Notably, most studies in the area stem from reports of local epidemics, which estimate the occurrence of more than 200,000 cases in specific contexts, but do not provide a real estimate of listeriosis incidence and prevalence.[6] This is likely attributable the fact that listeriosis is not a notifiable disease in Brazil, and there is no standardized surveillance protocol to evaluate it, even in pregnancy.[6]

Notwithstanding this scientific gap, prevention is considered the most effective strategy to control listeriosis.[4-6] This scoping review therefore aims to synthesize preventive measures against listeriosis in pregnancy as described in the scientific literature.

Methods

This scoping review adheres to the PRISMA Extension for Scoping Reviews (PRISMA-ScR) guidelines.[7] The study objective was developed using the PICOS strategy, where "P" represents listeriosis in pregnancy; "I" denotes the prevention of this condition; "C" refers to the comparison of different preventive methods; "O" focuses on avoiding the development of listeriosis during pregnancy; and "S" includes literature reviews and protocol guidelines.[8] Accordingly, the following guiding question was formulated: "Which methods are presented by the scientific literature to prevent listeriosis in pregnancy?"

The search strategy employed Boolean operators with descriptors such as "Listeriosis AND Pregnancy AND Prevention" and "Listeriosis AND Pregnancy AND Preventive Measures." The search was conducted on March 27, 2025, across the PubMed/MEDLINE, SciELO, Web of Science, Latin American and Caribbean Health Sciences Literature (LILACS), and Scopus databases.

In addition, reference lists of relevant studies and guideline protocols were manually screened. Screening of titles, abstracts, and full texts was performed sequentially to include only articles that addressed the guiding research question. Rayyan® software was utilized to facilitate and organize the review process.[9] Article selection was based on the inclusion and exclusion criteria outlined in Table 1.

Data extracted included information on the country of study, study design, journal, impact factor, study type, population assessed, proposed preventive measures, main results, and conclusions. Finally, no prior registration of this review protocol was made in PROSPERO.

Results

The initial search strategy yielded a total of 449 citations (Figure 1). After applying the predefined inclusion and exclusion criteria, seven articles met the eligibility criteria and were included in the final review.

The characteristics of the selected studies are summarized in Tables 2 and 3. The majority of studies originated from the United States (S1, S2, S5), followed by contributions from Canada (S4), France (S3), Australia (S6), the Netherlands (S6), and China (S7). Most of the included articles were systematic reviews (S1, S2, S6), with publication dates ranging from 2004 to 2021.

Table 1

Inclusion and exclusion criteria regarding studies' selection.

Inclusion criteria	Exclusion criteria
Studies focusing on listeriosis in pregnancy	Studies on listeriosis in non-pregnant individuals
Studies evaluating preventive measures for listeriosis	Studies focusing primarily on treatment rather than prevention
Comparative studies on different prevention strategies	Studies without a clear preventive component
Studies assessing the prevention of listeriosis development in pregnancy	Studies with outcomes unrelated to listeriosis prevention
Literature reviews and guideline protocols	Case reports, case series, animal studies, in vitro studies

Figure 1

Study selection flowchart for the systematic review.

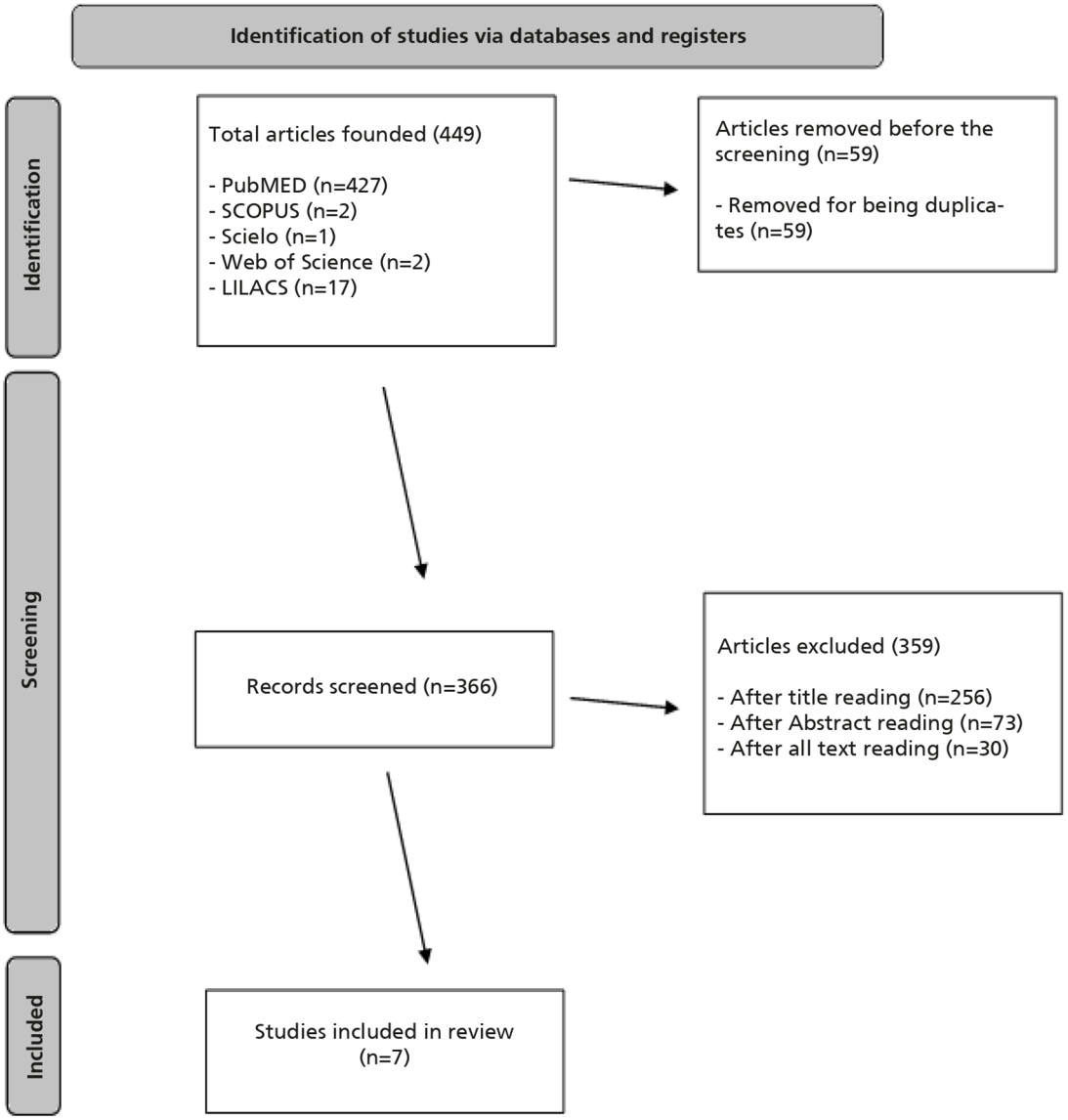

Table 2

General characteristics from the included articles: title, authors, year of publication, local and study type.

Study	Title / Country / Year	Authors and year of publication	Study type
S1[10]	Pregnant women and listeriosis: preferred educational messages and delivery mechanisms; United States of America; 2004	Cates *et al.*[10]	Systematic review
S2[11]	Listeriosis in human pregnancy: a systematic review; United States of America; 2011	Lamont *et al.*[11]	Systematic review
S3[12]	Listeriosis and pregnancy; France; 2014	Charlier-Woerther *et al.*[12]	Review without specification
S4[13]	Listeriosis during pregnancy; Canada; 2017	Madjunkov *et al.*[13]	Review without specification
S5[14]	Listeriosis in Pregnancy: A Review; United States of America, 2019	Craig *et al.*[14]	Review without specification
S6[15]	Nutrition and listeriosis during pregnancy: a systematic review; Australia and Netherlands; 2018	Moran *et al.*[15]	Systematic review
S7[16]	An Update Review on Listeria Infection in Pregnancy; China; 2021	Wang *et al.*[16]	Update review

Table 3

Aims, preventive measures explored, mainly results and conclusions from the included articles.

Study	Aims	Preventive measures explored	Main results and conclusions
S1[10]	To characterize pregnant women's food safety practices, to evaluate the impact of existing educational messages on the risks and prevention of listeriosis, and to identify preferred delivery methods for educational initiatives.	Educational measures about the consumption and handling food in pregnancy	The study identified the need to develop educational materials on listeriosis targeted specifically to pregnant women and to partner with obstetricians and other healthcare providers to deliver these materials to pregnant women.
S2[11]	To gather and describe the main information found in the literature on Listeriosis	Centers for Disease Control and Prevention recommendations and improved patient awareness	Ready-to-eat meats and dairy products made with unpasteurized milk should be avoided, and vigilance should be exercised to prevent cross contamination of foods by ensuring that preparation and cooking utensils and food preparation surfaces are clean
S3[12]	To present an overview of listeriosis during pregnancy.	Prevention in pregnant women relies on adherence to strict diet recommendations such as reheating of leftovers until steaming and the avoidance of unpasteurized dairy products, cold deli meats, meat spreads and pâtés	Listeriosis is a serious health condition that can be prevented through general food hygiene measures.
S4[13]	To summarize the current knowledge on listeriosis during pregnancy.	For patients, keep good sanitary and hygiene practices, having a proper food storage, preparation and handling, since producers till consumers. For professionals, follow the hospital infection control protocols and advising patients about the risk of infection during pregnancy and the necessity of preventive measures. For authorities, to create a rapid alert system and surveillance, supervising the production and distribution of goods	Prevention remains the most effective strategy to control listeriosis and should be reinforced among patients, healthcare professionals, and regulatory agencies.
S5[14]	To summarize the clinical and relevant evidence available on listeriosis in pregnancy and educate providers on common clinical symptoms, sequelae, and appropriate treatment guidelines.	Educational measures such as explaining how to avoid listeriosis by consuming foods of guaranteed origin, which are stored and prepared correctly	Given the expected rise in incidence and the increased susceptibility of pregnant women, prevention is essential
S6[15]	To assess the association between listeriosis and population-level recommendations during pregnancy to confirm appropriateness of these guidelines	Uptake and adherence to guidelines by professionals and pregnant women	Further research is warranted to assess means of improving the reach, uptake, and generalizability of population guidelines for reducing listeriosis during pregnancy.
S7[16]	To collect and present clinical and empirical findings regarding the mechanism, clinical manifestations, obstetrical outcomes, diagnosis, treatment, vertical transmission, neonatal infection, and prevention of listeriosis proposed by the scientific literature	Adhere to general hygiene measures when handling and consuming food. Guidance from medical professionals and establishment of protocols and guidelines at national levels	Governments should strengthen listeriosis surveillance to reduce the incidence rate

The preventive measures explored in the included studies predominantly emphasized educational interventions, particularly regarding food safety recommendations tailored to different cultural and regional contexts (S1 - S7). These measures focused on improving adherence to formal guidelines issued by health authorities, such as the Centers for Disease Control and Prevention (CDC) and the World Health Organization (WHO), which recommend avoiding high-risk foods, including unpasteurized dairy products, deli meats, smoked seafood, and refrigerated pâtés (S2,S4). Furthermore, several studies highlighted the importance of professional training for healthcare providers – including obstetricians, midwives, and dietitians – to effectively educate pregnant women about listeriosis risks, proper food storage, and safe food handling practices (S1, S3-S5, S7).

In addition to individual education, studies emphasized the role of public policies in enforcing preventive strategies that reflect local food consumption patterns and socio-economic realities (S1, S3, S4, S7). In some regions where traditional diets include unpasteurized dairy or fermented foods, public health campaigns need to be adapted to ensure cultural acceptability without compromising safety (S3, S6, S7). Moreover, the studies underscored the necessity of targeted interventions in vulnerable populations, such as women with limited access to healthcare or lower health literacy, who may

require alternative communication strategies, including community-based outreach, multilingual materials, and digital health platforms (S2, S3, S6, S7).

Furthermore, enhanced surveillance systems were also identified as a crucial component of listeriosis prevention (S1, S2, S3, S4, S5). Studies called for more rigorous monitoring of food production chains, improved tracking of outbreaks, and stricter enforcement of food safety regulations to minimize contamination risks (S1, S2, S3, S4, S5). Specifically, strengthening rapid alert systems and ensuring timely responses to contamination events were highlighted as essential measures to reduce incidence rates (S1, S2, S3, S4, S5).

Finally, a multidisciplinary approach was deemed fundamental for effective prevention (S1 - S7). This includes collaboration between patients, healthcare professionals, food safety regulators, policymakers, and the food industry (S1 - S7). Obstetricians and nutritionists should work together to reinforce preventive behaviors among pregnant women, while regulatory agencies should partner with food producers to ensure compliance with safety standards (S1 - S7). Public health authorities must also engage with the media and educational institutions to develop campaigns that effectively communicate listeriosis risks and preventive actions to the general public (S1 - S7).

Discussion

Challenges

The studies included in this review highlighted several challenges in the practical implementation of listeriosis prevention strategies, particularly among pregnant women.[11,13,15,16]

Among the challenges mentioned, the lack of knowledge among pregnant women about the mode of transmission, risks, and preventive measures for listeriosis stands out.[10-12,17] Consequently, the studies highlight the need for effective educational campaigns, aimed at both pregnant women and healthcare professionals, so that they can act as agents of knowledge dissemination about this condition.[10-15,18]

Another relevant issue raised by the studies is the lack of standardization of preventive measures associated with listeriosis.[19,20] Namely, differences in infrastructure, resources, and methodological rigor adopted by different countries and industries lead to inconsistencies in recommendations and hinder practical and effective public health interventions.[19,20] Therefore, the authors argue for the creation of common supranational and interinstitutional protocols, whose guidelines must allow for adaptation to local and specific contexts.[20,21]

Educational Interventions

Rather than merely recommending educational measures, the discussion focuses on how such measures can be implemented.[13,14,21] Consequently, many authors recommend using the guidelines and booklets created by the CDC and WHO as means of disseminating reliable information on the subject.[12-15,21] Accordingly, public campaigns involving the distribution of printed and digital materials to individuals, especially pregnant women, are recommended.[12.15] Despite existing obstacles to these actions – such as limited internet access in certain communities, low literacy levels, and language barriers – the development of multilingual educational resources, culturally adapted food safety campaigns, and the integration of listeriosis education into existing prenatal care protocols offer potential solutions to overcome them.[10,11,13,22]

Role of Healthcare Professionals

Healthcare professionals play a critical role in listeriosis prevention, as they serve as a trusted source of information for pregnant women.[10,13,23] Prenatal care visits provide an ideal setting for educating patients on food safety practices, the risks of listeriosis, and the importance of adhering to preventive guidelines.[11,13,23] Nevertheless, inconsistent access to prenatal care and the lack of sufficient training on foodborne disease prevention for healthcare providers may hinder these efforts.[14,16,24] In light of this, investing in continuing education for healthcare professionals, developing standardized counseling protocols, and incorporating food safety education into routine prenatal care are potential strategies to overcome these difficulties.[14,16,25]

Surveillance and Regulation

Effective prevention is also contingent upon robust food safety regulations and surveillance systems.[13,17,26] Governments must enforce stricter control of high-risk foods, improve traceability, and ensure transparent communication with the public.[12-15,27] Enhanced surveillance, through mandatory case reporting, improved diagnostics, and real-time data sharing, is paramount to detect outbreaks and assess preventive measures.[13,15,27,28] International collaboration is essential to standardize surveillance and harmonize regulatory practices.[11,14,28]

Strengths and limitations

The study's adherence to the PRISMA-ScR guidelines ensures a structured and transparent methodological approach. The use of the PICOS framework to define the research question enhances the clarity and precision

of the study objectives. Furthermore, the comprehensive search strategy, which incorporated multiple databases and manual reference screening, increases the likelihood of capturing a broad range of relevant literature.

Conversely, the lack of prior registration in PROSPERO could impact the reproducibility of the study. Manual data extraction, while thorough, poses a risk of human error. Lastly, restricting the inclusion criteria to specific languages may have led to the exclusion of relevant studies published in other languages.

Future perspectives

Future research should focus on rigorously evaluating the effectiveness of current preventive measures, exploring novel strategies for foodborne disease mitigation, and identifying socioeconomic determinants that influence adherence to guidelines.[10,13,29] By reinforcing preventive strategies and fostering international cooperation, public health authorities can mitigate the risks associated with listeriosis in pregnancy, thereby reducing maternal and neonatal morbidity and mortality.[11,29,30] Efforts should remain dynamic and adaptive to emerging evidence, to ensure that listeriosis prevention remains a priority in maternal health initiatives worldwide.[13,29,30]

Conclusion

This scoping review demonstrates that listeriosis prevention in pregnancy requires integrated and context-sensitive strategies. Health education remains essential, but its success is contingent upon culturally adapted approaches, qualified healthcare professionals, rigorous regulatory enforcement, and robust surveillance systems. Crucially, beyond synthesizing existing evidence, this review emphasizes the need for coordinated actions between clinical practice and public health policies to ensure effective prevention. Strengthening these strategies is crucial to reduce maternal and neonatal risks and to elevate listeriosis prevention as a priority in maternal health agendas

Author's contribution

The author conceived the article and declared no conflicts of interest.

Data Availability

All datasets supporting this study are present in the article.

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