The Role of Probiotics in the Suppression of Streptococcus pneumoniae: Mechanisms, Experimental and Clinical Evidence, and Future Perspectives

Mahla Reza Gholizadeh[1], Parisa Azerang[2]*

1-M.Sc. student in Pathogenic Microorganisms, Department of Biotechnology, Faculty of Convergent Sciences and Technologies, Science and Research Branch, Islamic Azad University, Tehran, Iran.
2-Ph.D. in Pharmaceutical Biotechnology, Clinical Research Department, Pasteur Institute of Iran, Tehran, Iran,

*Corresponding author: Parisa Azerang ***** p.azerang@gmail.com

Abstract

Probiotics as a Novel Strategy for the Control of Streptococcus pneumoniae: From Colonization Inhibition to Immune Modulation Streptococcus pneumoniae is an important human respiratory pathogen responsible for diseases ranging from otitis media, sinusitis, and pneumonia to invasive infections such as bacteremia, sepsis, and meningitis. Nasopharyngeal colonization represents a key stage in pneumococcal transmission and pathogenesis. Although pneumococcal vaccination and appropriate antimicrobial therapy remain the major strategies for disease control, antimicrobial resistance and the complex interactions among pneumococci, the host microbiome, and mucosal immunity have stimulated interest in complementary approaches. In the 2024 WHO Bacterial Priority Pathogens List, macrolide-resistant *S. pneumoniae* was classified as a pathogen of medium priority. Recent experimental studies suggest that selected probiotic microorganisms and their derivatives may interfere with pneumococcal growth, epithelial adhesion, biofilm formation, and host inflammatory responses. Overall, future development of probiotic-based interventions against pneumococcal disease will require strain-specific screening, mechanistic characterization, standardized formulations, optimized dose and administration routes, rigorous safety assessment, and adequately powered multicenter clinical trials. Probiotics and postbiotics should currently be considered investigational complementary strategies rather than replacements for vaccination or standard antimicrobial treatment.

Keywords: Probiotics*; Streptococcus pneumoniae*; pneumococcus; Pneumococcal colonization; respiratory microbiome; antimicrobial resistance

Strengthening Epidemiological Surveillance of Emerging and Re-emerging Infectious Diseases in Iran: Priorities and Implementation Strategies

Ali Akbar Velayati[1], Amitis Ramezani[2,3]*

[1] Masih Daneshvari Hospital, Shahid Beheshti University of Medical Sciences, Tehran, Iran
[2]Clinical Research Department, Pasteur institute of Iran, Tehran, Iran,
[3] Iranian scientific society of infectious diseases

*Corresponding author: Amitis Ramezani ***** ramezaniamitis@gmail.com

Abstract

Background: Emerging and re-emerging infectious diseases pose persistent challenges to public health systems. Effective surveillance requires timely case detection, integrated laboratory and epidemiological information, intersectoral collaboration, and the capacity to translate surveillance signals into public health action.
Commentary: Iran faces diverse infectious disease threats, including zoonotic and vector-borne infections, vaccine-preventable diseases, respiratory infections, and healthcare-associated infections caused by antimicrobial-resistant organisms. Strengthening surveillance requires improvements in routine and event-based reporting, laboratory networks, molecular and genomic surveillance, wastewater monitoring where appropriate, and sentinel surveillance. Integration of antimicrobial resistance surveillance with hospital infection prevention and control is particularly important for detecting and responding to carbapenem-resistant organisms. Surveillance should also support the evaluation of immunization programs through monitoring of vaccine-preventable diseases, vaccination coverage, and pathogen characteristics. A One Health approach involving human, animal, and environmental health sectors is essential for addressing zoonotic threats. Sustainable financing, workforce development, secure data sharing, and clear response protocols are necessary for effective implementation.
Conclusion: Iran should prioritize an integrated, risk-based, and action-oriented surveillance system with measurable performance indicators, strong laboratory–epidemiology links, and coordinated outbreak preparedness. The objective should be to ensure that reliable information leads to timely and effective public health interventions.
Keywords: Emerging infectious diseases; re-emerging infectious diseases; epidemiological surveillance; antimicrobial resistance; One Health; Iran.

Title: Awareness of Human Papillomavirus (HPV) Among Iranian Women: A Review of the Evidence, Existing Challenges, and Educational Needs

Masoomeh Sofian[1] Mohammad Banifazl[2], Anahita Bavand[3] and Amitis Ramezani[3,4]*

[1-]Infectious Disease Research Center, Arak University of Medical Sciences, Arak, Iran
[2-]Iranian society for Support of Patients with Infectious Diseases, Tehran, Iran,
[3-]Clinical Research Department, Pasteur institute of Iran, Tehran, Iran,
[4-]Iranian scientific society of infectious diseases, Tehran, Iran,

*Corresponding author: Amitis Ramezani * ramezaniamitis@gmail.com

Abstract

Background and Objective: Human papillomavirus (HPV) is the primary cause of cervical cancer, and vaccination and screening are important strategies for preventing HPV-related outcomes. Adequate awareness of HPV and available preventive measures is essential for informed decision-making and the appropriate use of preventive services. This article aimed to review the available evidence on awareness of HPV and its vaccines among Iranian women, factors associated with awareness, and existing challenges and educational needs.
Methods: Findings from studies conducted in Iran on knowledge, awareness, and attitudes toward HPV and HPV vaccination among women, parents, and healthcare workers were reviewed and compared narratively. The main topics included awareness levels, associated sociodemographic factors, attitudes and vaccination intentions, sources of information, barriers to vaccination, and educational needs.
Results: The reviewed studies generally indicated limited awareness of HPV, its health consequences, and HPV vaccines across different population groups. Awareness was associated with educational attainment and certain sociodemographic characteristics. In some studies, higher awareness was associated with more favorable attitudes or greater intention to receive HPV vaccination. However, concerns about vaccine safety, vaccine costs and limited access, inadequate structured education, and the circulation of misinformation on social media were identified as important challenges. Differences in study populations and assessment tools also limited direct comparisons between studies and the generalizability of findings to the national population.
Conclusion: Improving HPV awareness in Iran requires targeted, evidence-based education for women, parents, and healthcare workers. Integrating education into primary healthcare services, strengthening school- and university-based educational programs, enhancing healthcare workers' capacity to provide accurate information, and disseminating reliable Persian-language content on social media may help address existing educational needs. Multicenter studies using standardized assessment tools and evaluating the effects of educational interventions on preventive behaviors are also needed to inform more effective policies.
Keywords: Human papillomavirus; HPV; awareness; women; vaccination; health education; Iran