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METHODOLOGY TO PREVENT LEGIONELLOSIS, AS AN ENVIRONMENTAL DISEASE, CAUSE BY BACTERIA OF THE GENUS LEGIONELLA. (APPLICATION FOR A COURSE OF HOSPITAL ENGINEERING)

Federico León-Zerpa[1], Juan Carlos Lozano-Medina[2], Carlos Alberto Mendieta-Pino[2], Nicolau Chirinza Penicela[3] and Julia Claudia Mirza Rosca[4,5]
[1]Institute of Environmental Studies and Natural Resources (IUNAT), University of Las Palmas de Gran Canaria, Spain
[2]Department of Process Engineering, University of Las Palmas de Gran Canaria, Spain
[3]Universidade Zambeze. Unizambeze. Mozambique,
[4]Department of Mechanic Engineering, University of Las Palmas de Gran Canaria, Spain
[5]Transilvania University of Brasov, Materials Engineering and Welding Department, 29 Eroilor Blvd., 500036, Brasov, Romania, e-mail: julia.mirza@ulpgc.es

Abstract

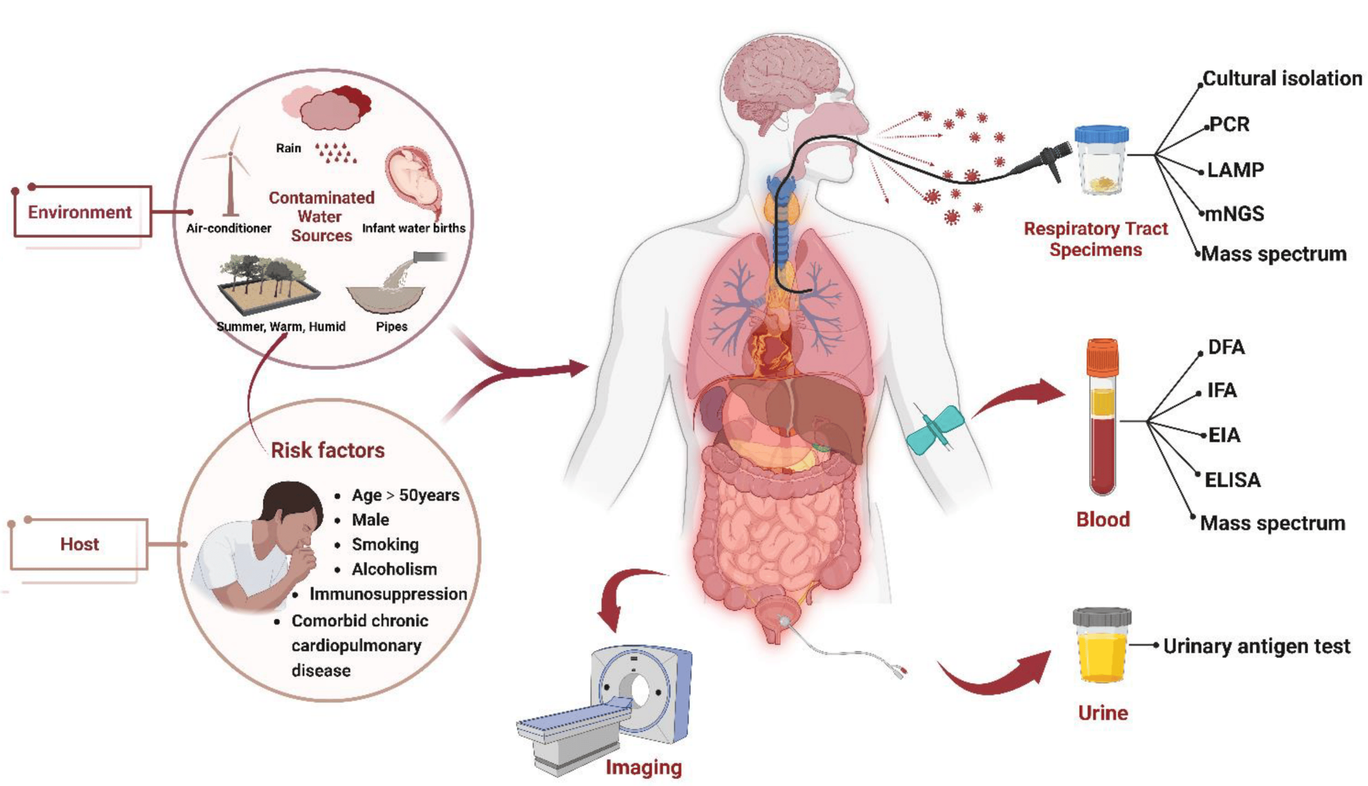
Legionellosis is an environmental disease caused by bacteria of the genus Legionella. Its manifestation includes Legionnaires' disease and Legionnaires' fever (Pontiac fever). Legionnaires' disease or pneumonic form presents as an acute respiratory illness with pneumological focality indistinguishable from other pneumonias, while the non-pneumonic form or Pontiac fever is a self-limiting acute febrile syndrome with absence of pneumonia. In Spain, legionellosis is a notifiable disease since 1997. Thus, in the period 1997-2000, a total of 706 cases were reported in Spain, with an increase in rates from 1.7 cases per 1,000,000 inhabitants in 1996 to 7 cases per 1,000,000 inhabitants in 2000. Legionellosis then began to be considered an epidemiological and public health problem. Consequently, the Ministry of Health published Royal Decree 909/2001, later repealed by RD865/2003, which establishes measures for the design, maintenance, and surveillance of at-risk facilities with the aim of preventing and controlling the disease

Objective

The objective and the novelty of this work is the development of rapid diagnostic systems for the disease (detection of SG1 antigen in urine), has made SG1 antigen detection in urine) has led to a considerable increase in the number of cases. The number of outbreak-associated cases reported also increased from 28 in 1997 to 175 during 2000.

Methodology

The epidemiological characteristics and risk factors (left) and the various pathogenetic detection methods available for Legionella pneumonia (right). The epidemiological characteristics mainly refer to contaminated water sources (e.g., rain, pipes, air-conditioning systems), summer, warm and humid soil, and water births. The risk factors include age, gender, smoking, alcoholism, immunosuppression, and comorbid chronic cardiopulmonary disease. PCR, polymerase chain reaction. LAMP, loop-mediated isothermal amplification. mNGS, metagenomics next-generation sequencing. DFA, direct fluorescent. IFA, indirect immunofluorescence assay. EIA, enzyme immunoassay. ELISA, enzyme linked immunosorbent assay.



Conclusions

Legionella pneumonia is a severe respiratory infection that can have fatal consequences. It is imperative to detect it early for effective treatment and to prevent irreversible damage to multiple organs. In clinical practice, timely diagnosis is particularly important for high-risk populations, critically ill patients, and those with weakened immune systems. Although traditional cultural isolation is highly specific, it can be time-consuming and labor-intensive. It is worth noting that serological tests may not be the most suitable option for immediate clinical treatment due to the possibility of cross-reactivity and delayed antibody production. With regards to urinary antigen tests, it is important to carefully consider the timing of urinary antigen excretion, although they are generally simple and rapid. It is also worth noting that mass spectrometry may not be able to distinguish Legionella at the serogroup level. The future of LP diagnostics seems to hold promise despite the challenges. It is worth noting that NAAT has emerged as a solution that can detect multiple pathogens simultaneously, including rare and emerging ones, in a single test. Additionally, mNGS is advantageous for co-infection cases and when there are no target pathogens, but standardization of read counts between different samples and facilities is necessary. This review has highlighted the various approaches to LP diagnosis that have been established.

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