Legionella is an emerging Public Health problem

The issue of Legionnaires' disease has emerged as a major public health problem, interesting not only researchers, but also managers of public and private organisations, those responsible for public health, the general population and occasionally magistrates.

The cases of legionellosis are increasing as a result of improved etiological diagnostic methods, population lifestyles and characteristics which favour the presence of the responsible organism in the environment which leads to the frequent exposure and transmission of the disease to at-risk groups whose relative numbers are growing.

Legionella spp is an opportunistic waterborne pathogen that finds its ideal habitat in warm-humid environments, it is able to survive in conditions unfavourable to other germs (elevated temperatures, presence of biocides, etc.) and multiply in particular ecological niches (amoebas and other protozoa, biofilm). Because of this, it frequently colonises the hot water systems of houses, hotels, campsites, sports centres, hospitals, tertiary care centres, etc., as well as air-conditioning cooling towers, evaporative condensers and places where water stagnates at temperatures of at least 20°C.

From our experience, the disease is frequently contracted by inhaling aerosols from the contaminated water systems of houses or work places, but it has also been contracted during stays in holiday accommodation, from using baths/showers in sports and recreation centres and finally during hospital stays.

The infection is quite common and approximately 10% of the general population has antibodies for the more common strains found in the environment, but fortunately the disease remains a rare phenomenon, and is usually associated with immuno-suppressed subjects, males, elderly, smokers, excessive drinkers and those with chronic-degenerative diseases. The risk of disease depends on the type and intensity of the exposure, even if the minimum concentration for infection is not known, as well as the species and/or serogroups, whose spread is variable according to their ability to survive under specific environmental conditions. The virulence of the strain is therefore important, with 80-90% of all cases being associated with the exposure to *Legionella pneumophila* sg 1, 3 and 6, even though these serogroups are not necessarily the most frequent in the environment. This problem is of particular interest to health services, as many of the building structures are contaminated, and patients are often debilitated and susceptible to becoming ill and to having severe pneumopathy, with an elevated risk of death.

National and international guidelines for the prevention of Legionnaires' disease have been published, benefiting those who face this problem, but in truth, definitive and standardised solutions do not yet exist. Those who find themselves having to control an outbreak of *Legionella* and having to take precautions to prevent Legionnaires' disease, should follow these recommendations: a) form a team of all interested parties: engineers, technicians, nurses, clinicians, microbiologists, public health doctors and eventually university experts in this field; b) examine the environment in which the organisms can be found, carefully studying the characteristics of the system, chemo-physical and bacteriological parameters of the water, understand the dynamics and characteristics of the contamination and identify the critical points in the water distribution system; c) estimate the risk in terms of numbers of exposed persons, their health status and virulence of isolated legionellae; d) decide which solutions to adopt after a careful quantification of the cost-benefit. Water decontamination is not generally sufficient to control the risk of infection, for which it is necessary to put into place a complex prevention plan, including system maintenance, training of health staff and implementation of a clinical surveillance system, aimed at early detection of cases.

It is dangerous to ignore the problem, as is creating alarm at the appearance of a case or an epidemic cluster. All the experts agree that health services who decide to face the problem by isolating *Legionella* from the environment and characterising the cases would have "to be rewarded" for their contribution to understanding the problem, rather than be exposed to public criticism from the press and media in general.

In four years of activity the Italian Multicentric Group for the Study of Legionnaires' disease (http://www.legionellaonline.it), thanks to the collaboration of large hospitals, hotel managers, Public Health departments and the population in general, has been able to gather interesting data and new information on: the spread of Legionella in Italian water systems, the molecular characteristics of the types isolated, the prevalence of the infection and the disease among the subjects recovered from pneumonia, and finally, the risk factors for infection.

Research and studies into this area are not exhausted and hygienists, in close collaboration with clinicians, microbiologists and all the other interested persons, are called to contribute to the construction of an integrated network of knowledge on *Legionella*, in order to substantially improve environmental control of the pathogen and to prevent the appearance of new cases, with indisputable advantages for the collective health of the population.

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