Abstract

An evaluation was made of the prevalence of *Legionella* species in hot water distribution systems in West Bank hospitals and their possible association with *Pseudomonas aeruginosa*.

*Legionella and P. aeruginosa* was investigated in this study in six West Bank hospitals - Ramallah, Alia- Hebron, Beit Jalla, Alwatani, Rafidia, and Jenin – representative of different region of West Bank (Northern, Central, and Southern West Bank). A total of 134 water samples were collected (53 samples for *Legionella* analysis, and 81 samples for *P. aeruginosa*).

*L. pneumophila* sg (2-14) was isolated from 33 (62.3%) of 53 samples that were analyzed. In the positive samples, the mean number of *L. pneumophila* sg (2-14) was $6.17 \times 10^3$ CFU/L with range from $100$ CFU/L to $2.85 \times 10^4$ CFU/L.

*P. aeruginosa* were isolated from 17 (21%) of 81 samples, with levels ranging from 1 CFU/200 mL to TNTC CFU/200 mL.

To assess the effect of heat disinfection on *L. pneumophila* sg (2-14), samples were taken from hospital tap water systems before and after thermal disinfection. In Biet Jalla hospital, the water system was heated to 80°C and held at this temperature for 30 minutes, all distal outlets were flushed with this hot water, positive samples with *L.*
pneumophila were reduced from 100% (before heat disinfection) to 17% (after heat disinfection). At Jenin hospital thermal disinfection was conducted at 70°C for 30 minutes, the concentration of Legionella was reduced, but not killed completely.

It was demonstrated that the high number of Legionella in water distribution systems can be successfully reduced by heat treatment, but not totally killed. However, thermal disinfection at 70°C for 30 minutes in Jenin hospital was successfully efficient for the elimination of all P. aeruginosa in water distribution systems, there was a reduction in P. aeruginosa positive samples from 100% to 0%.

In this study it was noticed that all the pediatric divisions in West Bank govermental hospitals were contaminated with either P. aeruginosa or L. pneumophila sg (2-14) or both, which is considered a real health hazard to children's health. Also the faucet in incubators room where premature babies bath in are contaminated.