PREVENTION OF LEGIONELLA IN HOSPITAL WATER

Cases of hospital-acquired legionnaires disease have been associated with infected water supply systems. Since the first environmental isolation of L. pneumophila was taken from a shower head[1], it has been widely assumed that shower aerosols might be a means for dissemination of the organism. The immunosuppressed nature of some patients in hospital increases the risk of legionnaires disease through contact with infected environmental sources.

In July 1991 a survey was undertaken by Environmental Health Officers of the South Western Sydney Public Health Unit, to ascertain the number of legionella organisms isolated in water samples collected from fixture outlets served by thermostatic mixing valves at Campbelltown Hospital.

As is the case in most hospitals, thermostatic mixing valves are used to supply tepid water (37-42 °C) to grouped fixtures in wards. In laboratory cultures, legionella will multiply actively between 20-45 °C[2].

Campbelltown Hospital was chosen for the survey as the hospital engineer had advised of problems with sediment from water supply mains. The sediment was being found in mixing valves during routine six-monthly maintenance.

It was assumed that the combination of sediment and optimum water temperatures in mixing valves and associated pipework leading to fixtures would provide an environment conducive to legionella multiplication.

METHOD

The survey was to represent a "worst case" scenario and was conducted just before six-monthly servicing of thermostatic mixing valves. Thirty water samples were collected from the first hot water fixture outlet serviced by a thermostatic mixing valve. Samples were collected from 7am and without any pre-flushing, so the sample would theoretically represent "first flush" water which had been stored in pipework between the mixing valve and hot water fixture outlet overnight. In most instances, fixture outlets had not been used by patients or staff before sampling was carried out. The water samples were submitted to the Division of Analytical Laboratories, Lidcombe, for microbiological analysis.

The 30 water samples submitted produced no legionella organism isolations.

DISCUSSIONS

Since legionella is chlorine-tolerant[3], the organism survives the standard reticulated water treatment process and passes into the water distribution system in small numbers[4,5].

Most literature recommends the use of fail-safe thermostatic mixing valves to mix hot water (>60 °C) and cold water (<20 °C) close to the point of end use, to control the multiplication of legionella organisms in tepid hot water required for bathing purposes in health care institutions. The section of the pipe containing the mixed water between the outlet fixture and mixing valve should be self-draining. In addition, the Hosplan Code of Practice for Thermostatic Mixing Valves in Health Care Facilities recommends:—

- Regular servicing and cleaning of thermostatic mixing valves, in accordance with manufacturer's recommendations, to remove sludge, slime and other sedimentary materials which may promote the growth of legionella.
- During routine servicing, the pasteurisation of the mixing valve and associated warm water lines with hot water at 70 °C for a period of not less than five minutes, to decontaminate the system.

The private contractor servicing the thermostatic mixing valves of Campbelltown Hospital was seen to pay particular attention to removing all sediment and slime from internal components of mixing valves AND pasteurisation of mixing valves and associated warm water lines, in accordance with the Hosplan Code, during routine six-monthly maintenance.

As the survey at Campbelltown Hospital was to represent a "worst case" scenario, and as the 30 water samples produced no legionella isolations, the results obtained are reassuring and reinforce the wisdom of using *regularly maintained* thermostatic mixing valves close to fixture outlets to control the multiplication of legionella organisms in hospital warm water systems.

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