Potentially life-threatening fungus found in water distribution systems of five French hospitals

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A specific strain of the fungus, Fusarium oxysporum, circulates in the water distribution systems of five French hospitals, in two widely separated cities. This microbe is potentially a life-threatening risk to immunocompromised patients. The research is published September 23, 2016 in *Applied and Environmental Microbiology*, a journal of the American Society for Microbiology.

Surprisingly, the genetic diversity of isolates of F. oxysporum was low among these isolates. "F. oxysporum is known to be a genetically diverse fungal species," said corresponding author Véronique Edel-Hermann, PhD, a molecular ecologist at INRA, Dijon, France.

The investigators then compared the hospital isolates with F. oxysporum from surrounding soils, which are the microbe's normal niche. The clonal lineage from the hospital water systems was absent from the soil samples—oddly, because "F. oxysporum is typically a soilborne fungus, and soil is generally considered the reservoir of diversity of this species," according to the report.

Furthermore, the soil-based F. oxysporum would not grow in "urban water," said Edel-Hermann. "Thus, this clone seems to be adapted to an aquatic environment irrespective of the geographic origin," she said. Nonetheless, F. oxysporum was not present in tap water from nearby non-medical buildings, according to the report.

According to the investigators, other studies have found it in the water systems of three geographically distant hospitals in Houston, TX, Seattle, WA, and Baltimore, MD. These isolates were the same strain as the isolates from the French hospitals. "It is quite worrying to discover that clinical and aquatic isolates are similar in different hospitals investigated worldwide," said the authors. These findings counter the hypothesis that patients might have contaminated the hospitals with the fungus.

The motivation for the research was the discovery of an increase in airborne fungal spores in a hematology unit during a construction project at Dijon Hospital. Subsequently, testing for Legionella in the hospital's water distribution system unexpectedly revealed Fusarium. At this point, the investigators began monitoring the water distribution system at this hospital for fungal contamination, and initiated similar monitoring at the other hospitals, including several in the French city of Nancy, where there was no construction going on. The fungus was present in all of them.

Invasive fusariosis is rare, but has occurred previously in hospitals. "Since [spores] may be aerosolized into air and inhaled by patients, it is essential to implement prophylactic measures in hospitals to control invasive fusariosis by using filters on taps and showers," said Edel-Hermann.

More information: Véronique Edel-Hermann et al. A clonal lineage ofcirculates in tap water of different French hospitals, *Applied and Environmental Microbiology* (2016). DOI: 10.1128/AEM.01939-16

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