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Outbreak of Stenotrophomonas maltophilia in the department of haemodialysis due to water contamination

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In the Unit of haemodialysis of a primary hospital in Brescia, northern Italy, regular controls of water used for the dialysis always resulted normal, i.e. cultures from point 1, 2 and 3 (figure 1) result negative.

On July 16th 2016, patient A had an episode of fever with chills after haemodialysis. Central venous catheter (CVC) was removed and the tip culture resulted positive for *Stenotrophomonas maltophilia*; blood cultures were negative.

On July 18th, after dialysis patient B had fever and chills. Blood cultures from CVC resulted positive for the same bacterium.

Randomized controls of the environment were made culturing swabs from healthcare carts, from faucet heads and the drain holes from the health care workers' (HCWs) sinks and from the patients' sinks.

The faucet head and drain hole of HCWs' sink resulted positive for *Stenotrophomonas maltophilia*. Flame-sterilization of the taps, the drain holes, the sinks, chlorination of the drain holes, replacement of the faucet heads and the tubes of the sinks that had resulted positive was performed.

On August 8th, patient C presented fever at the end of dialysis. Blood cultures resulted positive for *Stenotrophomonas maltophilia*.

So other culture swabs from the environment were performed: hand cream from the HCWs, antiseptic solution at patients' bed, environmental disinfectant. All these cultures resulted negative. Thus, further investigation was performed and throat swabs of all patients and HCWs were done. One HCW resulted positive for this bacterium.

Furthermore, blood cultures from all patients with arteriovenous (AV) fistula and venous catheter were taken. Cultures of two patients (patient D and E) with venous catheter resulted positive for *Stenotrophomonas*. We so realized that the 5 patients positive with this bacterium had a venous catheter.

Oral therapy and lock therapy with trimethoprim/sulfamethoxazole was started for patient A, B, C. Patient D and E were decolonized with the same lock therapy.

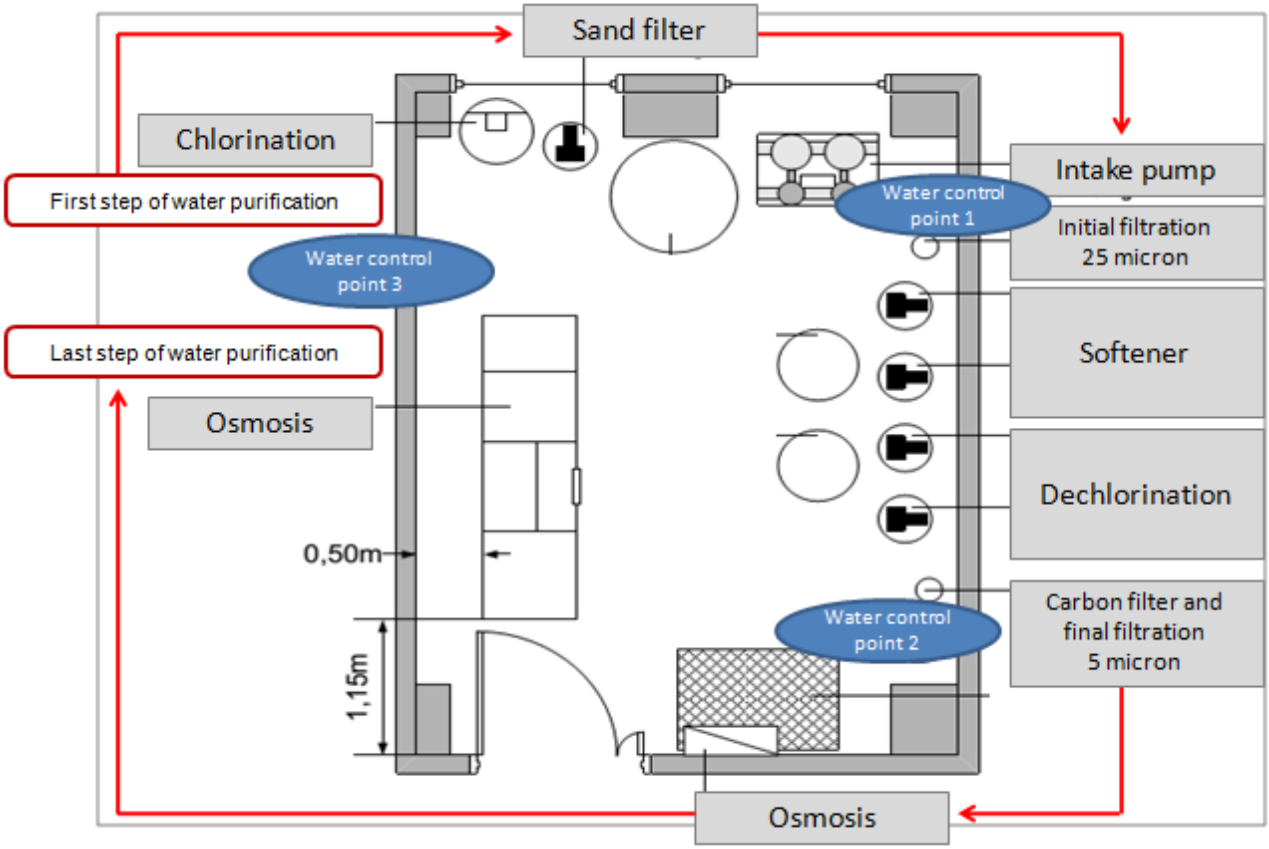
Water of dialysis was cultured again, but this time samples weren't inoculated onto nonselective chocolate agar but in blood culture bottles. Water from point 2 and 3 (figure) resulted positive for *Stenotrophomonas maltophilia*.

Filters from all points before osmosis (figure 1) were changed. New cultures were taken and resulted negative.

Until November no new cases were identified.

This outbreak shows interesting points: 1) the HCW with positive throat swab wasn't directly involved in the outbreak, 2) low quantities of bacteria may not be identified through routinely cultures but richer media may be needed, 3) *Stenotrophomonas* produces biofilm and this could explain why this bacteria was found only in patients with venous catheter.

Figure 1. Water purification system used in haemodialysis.


Sand filter
Chlorination
First step of water purification
Water control point 3
Last step of water purification
Osmosis
0,50m
1,15m
Water control point 1
Intake pump
Initial filtration 25 micron
Softener
Dechlorination
Carbon filter and final filtration 5 micron
Water control point 2
Osmosis