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The hospital tap waters: a risk of Legionella contaminated aerosol inhalation

Monique Reyrolle^a, Caroline Landelle^b, Céline Mazure^c, Marie-Christine Nicolle^d, Sophie Jarraud^e, Jérôme Etienne^e and Philippe Vanhems^f

^aCentre National de référence des Legionella, Centre de Biologie Est, Groupe Hospitalier Est, 59 Boulevard Pinel, 69 677 Bron, France

^blaboratoire hygiène hopital edouard herriot, place d'arsonval, 69008 lyon, France

^cBioRad, 3 avenue Raymond Poincaré, 92 430 Marnes la Coquette, France

^dlaboratoire hygiène hopital edouard herriot, placed'arsonval, 69008 lyon, France

^eCentre National de Référence des Legionella, Laboratoire de Bactériologie INSERM U851, Faculté de Médecine, IFR128, 7 rue Guillaume Paradin, 69372 Lyon, France

^fService d'Hygiène Epidémiologie et Prévention, Hôpital Edouard Herriot, 5 Place d'Arsonval, 69003 Lyon, France
monique.reyrolle@chu-lyon.fr

Background: Hospital-acquired legionellosis is recognized to be a severe pneumonia with a mortality rate of 20% for immunocompromised patients. The contaminated hot water showers are the main source of contamination but the contaminated aerosol from taps remains few documented. A case of fatal nosocomial Legionella pneumophila infection due to exposure to contaminated water from a washbasin in a haematology unit was recently reported (Brulet A, et al., 2008, Inf Hosp Epid, 29, 1091). Our objective is an analytical approach to improve exposure assessment to Legionella in aerosols generated by tap waters. The aim of this study is to evaluate the contamination of the aerosol generated by colonized washbasin water. **Methods:** A colonized hospital tap was investigated. The water was running 30 min and 2 impingement technologies of aerosol collection were used: Impinger (Arelco) and CIP10M (Bio-Rad) air sampler. Each aerosol was collected in a DNA free buffer (BioRad) compatible with culture. The air collections were respectively 300 L in 3 mL for CIP and 360 L in 20 mL for Impinger. The water samples (WS), samples from 2 CIP and 2 Impingers were tested in each run and repeated 10 times. 20 WS and 40 aerosol samples were tested for Legionella using 2 methods: culture NFT90-431 and PCR XPT 90-471 using BioRad method (Aquadien kit, iQ-Check Legionella, Chromo4). The ATP value (Aquatools), Pseudomonas (NF EN ISO 16266) and microbial colonization were also analysed for 3 runs. **Results:** The WS of the tap were positive for culture (103-4 CFU/L Lp 1 and L. anisa) and for PCR (Lp and Lspp 104 GU/L). No cultivable Legionella were reported for the aerosol samples. 18/40 aerosol results were positive for PCR Lspp: 3-57 GU/well and 5/40 aerosol results were >DL and <QL for PCR Lp (respectively 2.5 and 15 GU/well). The ATP concentrations of aerosol samples were 0.8-5.2 pg/ml, the results of Pseudomonas were <1 CFU/100ml and microbial analysis showed no colonization. **Conclusions:** The aerosol generated by colonized water of a washbasin showed the presence of Legionella DNA and could be a source of contamination for high risk patients. Further analyses are in process to investigate the potential viable Legionella (Dusserre E, et al., 2008, AEM, 74, 4817).

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