Caselli et al 2018 - Summary

Study title: Reducing healthcare-associated infections incidence by a probiotic-based sanitation system: A multicenter, prospective, intervention study

Study registration number: ISRCTN58986947

Study setup: From 1/1/2016 – 30/6/2017 the probiotic Chrisal products were applied (as crucial part of the PCHS cleaning system) in 6 medium to large hospitals in Italy. Comparison was made with chlorine based chemical cleaning/disinfection products. The number of **pathogens on surfaces** were measure, as well as **antibiotic resistance** and the number of **hospital acquired infections**.

Results: 11.842 patients and 24.875 surface samples were analysed and provided the following results:

1. **Surface pathogens**
   The following pathogens were analysed: Staphylococcus spp, Enterobactericeae spp, Pseudomonas spp, Acinetobacter spp, Clostridium difficile and Candida spp.. Probiotic cleaning reduced the risk of the above pathogens on surfaces with **83%**
2. **Antibiotic resistance**
   All surface pathogens were screened for antibiotic resistance. Also, the Bacillus probiotics from the product, as well as 120 Bacillus isolates from hospital surfaces were analysed for antibiotic resistance by microarray. No acquired antibiotic resistance was found among the probiotic Bacillus species meaning that the probiotics do not develop or transfer resistance. Furthermore, up to **2 log (= 100x) less antibiotic resistance genes** were detected among the pathogens.
3. **Hospital acquired infections**
   From the 11.842 patients, 284 patients contracted a hospital infection during conventional cleaning and 128 during probiotic cleaning. Probiotic cleaning resulted in **54,8% less hospital acquired infections**.

Conclusion: **The study by Caselli et al, 2018 proofs that the use of probiotic cleaning in hospitals lowers the risk of pathogens on surfaces, lowers the number of antibiotic resistance genes and lowers the amount of hospital acquired infections with 54,8%!**

Previous studies and the EU Ecolabel already demonstrated that Chrisal probiotic cleaning products are effective, safe and environment beneficial.

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RESEARCH ARTICLE

Reducing healthcare-associated infections incidence by a probiotic-based sanitation system: A multicentre, prospective, intervention study

Elisabetta Caselli[1,2]*, Silvio Brusaferro[3], Maddalena Coccagna[2], Luca Arnoldo[3], Filippo Berloco[4], Paola Antonioli[5], Rosanna Tarricone[6], Gabriele Pelissero[7], Silvano Nola[8], Vincenza La Fauci[9], Alessandro Conte[3], Lorenzo Tognon[10], Giovanni Vitone[11], Nelso Trua[12], Sante Mazzacane[2], for the SAN-ICA Study Group[1,2,3,4,5,6,7,8,9,10,11,12¶]

Abstract

Healthcare Associated Infections (HAI) are a global concern, further threatened by the increasing drug resistance of HAI-associated pathogens. On the other hand, persistent contamination of hospital surfaces contributes to HAI transmission, and it is not efficiently controlled by conventional cleaning, which does not prevent recontamination, has a high environmental impact and can favour selection of drug-resistant microbial strains. In the search for effective approaches, an eco-sustainable probiotic-based cleaning system (Probiotic Cleaning Hygiene System, PCHS) was recently shown to stably abate surface pathogens, without selecting antibiotic-resistant species. The aim of this study was to determine whether PCHS application could impact on HAI incidence. A multicentre, pre-post intervention study was performed for 18 months in the Internal Medicine wards of six Italian public hospitals (January 1st 2016—June 30th 2017). The intervention consisted of the substitution of conventional sanitation with PCHS, maintaining unaltered any other procedure influencing HAI control. HAI incidence in the pre and post-intervention period was the main outcome measure. Surface bioburden was also analyzed in parallel. Globally, 11,842 patients and 24,875 environmental samples were surveyed. PCHS was associated with a significant decrease of HAI cumulative incidence from a global 4.8% (284 patients with HAI over 5,930 total patients) to 2.3% (128 patients with HAI over 5,531 total patients) (OR = 0.44, CI 95% 0.35–0.54) (P<0.0001). Concurrently, PCHS was associated with a stable decrease of

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