

Measurement and evaluation of the effectiveness of hand hygiene among food service workers

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Abstract

The bacterial flora of the hands consists of transient and resident microorganisms. The former are temporarily present on the skin surface, whereas the latter colonize the deep skin layers and follicles and maintain codependent relationships with humans. Since the hands can serve as a source of pathogen transmission, sustained compliance with hand hygiene is a primary focus of infection control measures. We evaluated the status of hand hygiene among food service workers in Hospital A and standardized assay techniques used in the evaluation. Tottori J. Clin. Res. 7(1), 54-63, 2016

Key Words: hand hygiene, bacterial colony, agar-plate culture method using Food Stamp plates (Stamp test), ATP + AMP assay, contact pressure, contact time

Introduction

The Unit of Nutrition Management of Hospital A measures post-washing bacterial counts on the hands of its food service workers by an agar-plate culture method using Food Stamp plates (Stamp test) on a monthly basis to prevent food poisoning. However, despite being taken after handwashing, samples from several workers often contained more than 30 colonies or an even higher number of colonies compared with their pre-washing values, indicating potential difficulties in evaluating hand hygiene efficacy. Therefore, we aimed to develop an appropriate method to evaluate the effectiveness of hand hygiene practices.

Subjects

Experiments 1 and 2 included 19 subjects consisting of 4 dietitians, 12 cooks, 2 laboratory technicians, and 1 nurse, and Experiment 3 had 15 consisting of 2 dietitians, 9 nurses, 2 nurses' aides, and 2 office workers.

Methods

(1) Experiment 1: Stamp test and ATP assay (May 2012)¹⁻³⁾

A conventional Stamp test and an ATP assay

were performed before and after handwashing, and pre- to post-handwashing changes in the two parameters were compared.

(2) Experiment 2: Stamp test and ATP + AMP assay (July 2012)

Pre- to post-handwashing changes in contamination levels determined using the conventional Stamp test and an ATP + AMP assay were compared.

(3) Experiment 3: Standardization of Stamp test techniques (May-July 2013)³⁾

In Experiments 1 and 2, we identified several methodological factors that could affect the results of the conventional Stamp test. To minimize them, the length of time for which a Food Stamp plate was pressed against the skin (contact time) and the amount of pressure applied to the plate (contact pressure) were modified to determine optimal sampling conditions.

(4) Statistical analysis

Using Excel Statistics 2010 (SSRI, Tokyo), the significance of differences was determined by Friedman and Wilcoxon signed-rank sum tests for