Reviewer's report

Title: Determination of decimal reduction time (D value) of sanitary agents in hospital usage.

Authors:

Priscila G Mazzola (priscila_mazzola@hotmail.com)
Dr Thereza CV Penna (tcypenna@usp.br)
Alzira M Martins (alzira_martins@edwards.com)

Version: 2 Date: 14 Apr 2003

Reviewer: Waldemar Gottardi

Level of interest: A paper whose findings are important to those with closely related research interests

Advice on publication: Unable to decide on acceptance or rejection until the authors have responded to the compulsory revisions

1) Comments

The comparison of the activity of disinfectants against microbes is generally of clinical importance and therefore basically of interest. This publication outlines a certain aspect, i.e. the incubation time needed for a 10-fold reduction of viable test organisms. The selected disinfectants and their antimicrobial activity are already well-known in public health. Prior to publication this manuscript needs major improvements.

a) Discretionary revisions

There are only compulsory revisions.

b) Compulsory revisions

There are a number of confusing statements and decisive lacks of precision in the manuscript. The most important points are mentioned.

General:
Some concentrations of disinfectants are demonstrated repeatedly in a wrong way throughout the manuscript including the summary and table 1: For instance, 0.4 g/mL does not equal 0.04% (page 5), 2g/mL not 0.2%, and 0.5g/mL not 0.05% (page 6) etc. Decimal numbers should be presented consistently, e.g. at maximum one decimal in time statements.

Background:
Page 3, first paragraph: The definition of sterilization is wrong. Sterilization means complete killing of all forms of microorganisms.
Page 3, third paragraph: There is no valuable information, and therefore this paragraph should be omitted.

Method: At which temperature and in which medium were the microorganisms cultured? Were they washed?
The authors describe that they transferred 1 ml of a 24 h suspension of bacteria to 100 ml of sanitizer solution, but in Figure 1 they started with only about 1 x 10^2 colony forming units. This would be much too low for valuable testing. So, how many cfu's were exposed to the disinfectants at time zero? Which dilutions in what did they apply before plating? Temperature and pH of the disinfecting solutions during the tests? There should be added some details about intervals of incubation times as provided for glutaraldehyde in figure 1. The last sentence on page 4 is not sufficient to address this question. Did they perform negative controls (described as "should be made" on page 4 under D value determination) and - what would be more important - positive growth controls for the used bacteria?

What do the authors mean with "reduction of ... log10 cycles" (e.g. definition of D value)? Usually this is described as e.g. "6 log10 reduction in viable counts" or as a "logarithmic reduction factor of 6".

Spore formers: Did they use spore suspensions or suspensions of vegetative forms of these bacteria? A definition of "adequate biological indicator" should be provided (page 6 etc).

The definition of D value has been described twice. The paragraphs "D value determination" and "D value" should be contracted to one paragraph avoiding repetitions.

Results:

The second sentence "However, there ... usage in hospital routine" is confusing. What do the authors want to say?

Page 5, chlorhexidine: D values of 8.3 or 5.9 minutes do not mean that these strains are "resistant" to chlorhexidine! What is "inactive activity" (page 6, formaldehyde, last sentence of the first paragraph) and "a little inactive" (page 7, 4th paragraph)?

Table 1: What does "t" mean in the third column? How many times were the experiments repeated? Sanitizer concentration: probably the authors mean g/L instead of g/mL (??).

Figure 1: This figure must be indicated in the text. Was the cfu count at time zero virtually as low as 1.5 to 2 log10? How many repetition experiments?

Obviously, the 6 and 12 log10 reductions have been calculated and not determined experimentally. This should be stated clearly! Moreover, conclusions from such calculations might be wrong, e.g. if a mixture of vegetative forms and spores would give a rapid D value but it would take more time than 6 x D value to inactivate spores.

Discussion:
The authors must discuss how there results fit to the present guidelines at least in their country. The discussion is a listing of results and guidelines, but it is completely unclear which conclusions can be drawn from the results of this study. The results should be separated from the discussion, and the discussion should deal concisely with the results of this study.

Abstract: The last sentence of methods can be omitted since 6 and 12 log10 reductions are not mentioned
again in the results in the abstract. Instead of that, it should be mentioned that quantitative cultures were performed for evaluation.
The results are presented largely confusing in the abstract. Only two (or three) example organisms and their D values should be described for the different disinfectants, in the same order in each case.
The conclusion is confusing. For improvement see the suggestions for "discussion".

Competing interests:
None declared.