Reviewer's report

Title: In-vitro analysis of the microbicidal activity of 6 contact lens care solutions

Version: 2 Date: 15 July 2012

Reviewer: Ojan Assadian

Reviewer's report:

Re: Manuscript BMC Infect Dis 2012: In-vitro analysis of the microbicidal activity of 6 contact lens care solutions.

The authors investigated in this in-vitro study six commercially available contact lens care solutions following a modification of the methods described in the EN ISO 14729 by adding a novel artificial tear fluid as organic load.

Only one tested product passed the requirements of the EN ISO 14729, both with and without organic load. Two further products met the requirement only in presence of organic load. The authors conclude that the artificial tear fluid used in this study influenced the disinfecting efficacy of contact lens care solutions and therefore the EN ISO 14729 should be modified to use more realistic conditions. Furthermore, it is proposed that the EN ISO 14729 should be added to the European test hierarchy for chemical disinfectants and antiseptics.

1. Is the question posed by the authors well defined? - yes
2. Are the methods appropriate and well described? - yes
3. Are the data sound? - yes
4. Does the manuscript adhere to the relevant standards for reporting and data deposition? - yes
5. Are the discussion and conclusions well balanced and adequately supported by the data? -yes
6. Are limitations of the work clearly stated? -yes
7. Do the authors clearly acknowledge any work upon which they are building, both published and unpublished? -yes
8. Do the title and abstract accurately convey what has been found? -yes
9. Is the writing acceptable? -yes

The study question is well defined and the method is adequately performed. The manuscript is well written. However, the following aspects should be considered by the authors:

C1. Background, lines 10-12: The authors state as one of the risk factors for keratitis the possibility of purchasing CL solutions through the internet. “Another factor is the possibility of purchasing CL products via internet or at general retail outlets, which misleads the wearers to careless and neglectful CL handling and
to practice suboptimal CL hygiene [37].” While the indirect risks of purchasing medical items without receiving thorough instruction for use is understandable and a reference is given, this aspect opens the door to a totally different discussion. As with purchasing over the internet, CL care solutions can also be purchased in supermarkets and drug stores, in all cases without receiving proper education. In the end it is always the manufacturer’s instruction for use, which must contain the required instructions.

For clarity and brevity, however, it is recommended to omit the above sentence completely, as this important aspect does not add to the current question at study here.

C2. Background: Do the manufacturers of the CL care solutions claim that their respective product has an antimicrobial efficacy?

C3. Methods, Artificial tear fluid: The authors used a mixture of human blood serum, 0.5 % lysozyme, and 0.1 % mucine as an artificial tear fluid simulating real conditions. While the use of lysozyme and mucine are plausible, the reader stumbles why human blood serum was used and not e.g. albumin. Later, in the discussion section, the authors give an acceptable and plausible explanation for the composition of their artificial tear fluid. However, it is recommended to give a brief explanation already in the method section, such as e.g. “Human blood serum was added because of its similarity of pH value, osmolality, ionic strength, and protein composition to natural tear fluid”.

C4. Discussion: The authors elegantly have highlighted the antimicrobial efficacy of lysozyme against various microorganisms, and its possible role in distorting the results with and without organic load. While the unexpected result that some CL care solutions performed better with organic load than without is adequately addressed and explained, the question remains if adding 0.5% lysozyme into the artificial tear fluid did not bias the study results. It remains doubtful if 0.5% active lysozyme will be found in CL care containers in reality, and therefore CL care solutions which did not pass the EN ISO 14729 without load will perform better in presence of normal loads found in real life CL care containers. In fact, CL care solutions which did not fulfil the EN ISO 14729 without load must not be tested further with the presence of an organic load.

C5. Discussion, lines 13-14: The authors state that “Surprisingly, the great majority of CL wearers still choose MPSs instead of hydrogen peroxide based CL solutions.” In fact, this trend is not surprising at all, and the authors give the correct explanation for this some few lines later. Therefore, it is recommended to delete the word “surprising”.

C6. Discussion, page 16: The authors correctly state that “another factor which should be considered when testing CL care solutions is that the disinfecting efficacy of polyhexanide based MPSs can decrease after extended periods of storage due to the accumulation of polyhexanide on the CL material or CL case”. It should be added that particularly the antimicrobial efficacy of H2O2 based compounds are extremely sensitive to storage time, and that high antimicrobial reduction usually is found in unopened containers or opened containers no
longer opened than 2 weeks. Obviously, the results presented are based on fresh, previously unopened commercially available CL care solutions.

C7. General remark: Please correct the terms “gram-negative” and “gram-positive” to “Gram-negative” and “Gram-positive”, since “Gram” stands for Hans Christian Gram, a family name.

(end of referee’s report)

**Level of interest:** An article whose findings are important to those with closely related research interests

**Quality of written English:** Acceptable

**Statistical review:** No, the manuscript does not need to be seen by a statistician.

**Declaration of competing interests:**

I declare that I have no competing interests

Non-financial competing interests in relation to this paper: I declare that I know the authors of this manuscript and that I have professionally cooperated with the authors in the past. I have, however, no collaboration of the topic of the submitted manuscript.