Reviewer's report

Title: Investigation of the anti-cataractogenic mechanisms of curcumin through in vivo and in vitro studies

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Reviewer: Hyuk Jin Choi

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Reviewer's comments

Manuscript BOPH-D-17-00163; "Investigation of the anti-cataractogenesis mechanisms of curcumin: in vivo and in vitro studies" by Tao Wang, Jing Cao and Meng Wang

The authors investigated the anti-cataractogenic activity of curcumin using in vivo and in vitro experiments. They concluded that curcumin might attenuate selenite-induced cataract by reducing intracellular production of reactive oxygen species and protecting cells from oxidative damage.

This manuscript is quite interesting and informative but overall English expression should be polished. Moreover, there are some issues that need improvement and clarification.

1. Abstract

No mention about HSP70 and GSH-Px in the Methods, which just can be found in the Results.

2. Selenite-induced cataract model

I think this model is already used in studies elsewhere. If so, kindly provide us with relevant reference.

3. Statistical analyses

I'm not sure parametric methods (t-test) is suitable to analyze the data in this study. Considering the number of subjects (6 rats in each group) or experiments (3 times) is relatively small, non-parametric tests are considered to be more suitable to determine the statistical significance. If non-parametric tests are more suitable, overall results can be changed according to the proper statistical analyses.
4. Figure 1

From these photos, I'm not sure the opacity (B) was developed in the lens (corneal opacity also can be seen similarly). And anti-cataractogenic effect of curcumin (C) is doubtful. For the readers' understanding, I recommend the authors present more magnified images just showing the lens, iris and cornea.

5. Description in the Methods and Figure 2

For readers' smooth understanding, how about modifying the order of molecules described in the Methods (page 6 Biochemical examinations) and presented in the Figure 2 according to their properties?

For example) HSP70 (heat shock protein), 8-OHdG, MDA (oxidative stress markers), CAT, SOD and GSH-Px (free radical scavengers)

6. Figure 3B-D

The actual value presented in Figure 3B (12.8%) is different from that in the text (11.7%, page 9, line 3 (11.7% vs. 27.2%).

Moreover, the authors showed a result from just one experiment. We can't say that cell apoptosis is prevented by curcumin unless it is clearly proved by statistics.

7. HSP70

As the authors described in the Discussion, HSP70 might protect lens against a oxidative damage (maybe anti-cataractogenic effect). However, curcumin significantly suppressed HSP70 which was upregulated by selenite injection. The authors would better explain possible cause or clinical significance of this unexpected result.
Are the methods appropriate and well described?
If not, please specify what is required in your comments to the authors.

Yes

Does the work include the necessary controls?
If not, please specify which controls are required in your comments to the authors.

Yes

Are the conclusions drawn adequately supported by the data shown?
If not, please explain in your comments to the authors.

Yes

Are you able to assess any statistics in the manuscript or would you recommend an additional statistical review?
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I recommend additional statistical review

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Please indicate the quality of language in the manuscript:

Needs some language corrections before being published

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