Reviewer’s report

Title: Effects of different extracts of Curcumin on TPC1 papillary thyroid cancer cell line

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Reviewer: Namgung Uk

Reviewer's report:

Perma et al. investigated the anticancer effects of three different kinds of turmeric extracts using TPC-1 cancer cell line. They determined levels of several proteins related to apoptosis and inflammation and changes of cell survival after the treatment of curcumin extracts. From this study, they concluded that curcumin has a potential to be developed as a safe therapeutic agents. However, there are several drawbacks and uncertainties in the present study while there are some potentially interesting points.

Major comments

- One major drawback of this study is that the amount of data supporting their conclusion claiming changes by curcumin in cell proliferation/apoptosis and inflammation are quite limited. They only provided western blotting and MTT cell viability assays using cell lysates. Additional experimental observation using culture cells such as morphological studies, immunofluorescence observation of those marker proteins in cell treated with marker proteins, nuclear morphology, and TUNEL assay would be important to support their findings.

- Another issue is that even the western blot results are not solid enough to draw the conclusion. For most of the proteins they analyzed, this reviewer sees a pattern of overall elevation by 24 h treatment then dramatic decrease by 48 treatments. If these changes are true, there may be some coherent responsiveness of cells after prolonged exposure to drugs. However, some proteins are proapoptotic and others antiapoptotic as authors noticed. Notably, activities of p53 tumor suppressor, p21 Cdk inhibitor, proapoptotic caspase 3, and TNF should be positively related to further suppression of cancer cell survival after prolonged drug treatments (48 h time point); however, at 48 h time point, levels of all these proteins were very low while cancer cell viability was further reduced. I am wondering what levels of all marker proteins in control cells would be at 24 h and 48 h time points, which was not actually specified for 'Control' in Fig 1 and 2 in this study.

- In relation to above comments, quantification data in Fig 2 need to be more clearly defined. For instance, what kind of protein has been used as a loading control -- alpha tubulin (as
mentioned in Fig 2 legend)? Or beta tubulin (Fig 1 & Method section)? Do plots in Fig 2 represent the band intensity relative to actin ratio? What does Beta1 tubulin western in Fig 1 indicate? In fact, western blotting of actin (or tubulin) should be provided for western blotting for all of each protein in Fig 1.

- There are some additional issues that I want to point out in relation to text organization.

(i) Abstract -- background is somehow unnecessarily lengthy, whereas some important key findings were not described in Results.

(ii) Introduction - General pathophysiology about thyroid gland were too much stated, which is not mainly dealt in current study except for the use of thyroid cancer cell line.

(iii) Discussion --- Statement regarding target proteins in relation to a role of curcumin treatment is not well organized, and even confusing in many parts.

(iv) Reformatting the whole text and English corrections are required.

(v) Statistical analysis among comparison for three or more groups (Fig 2 & 3) should be done by one-way ANOVA.

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.

No

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

No

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