

Review of: "The Efficacy of Copper Nanoparticles in Treating Viral Skin Infections: A Systematic Review and Meta-Analysis"

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Potential competing interests: No potential competing interests to declare.

Dear Peer Review Team at Qeios,

Greetings,

I hope this message finds you well. I recently had the opportunity to review the manuscript titled "The Efficacy of Copper Nanoparticles in Treating Viral Skin Infections: A Systematic Review and Meta-Analysis" submitted for your consideration.

Overall, the manuscript presents a comprehensive analysis of the efficacy of copper nanoparticles in treating viral skin infections. However, I would like to highlight several points that I believe would significantly strengthen the quality and impact of the study:

Feedbacks :

1. Modify the keywords to ones that are better suited for the context.
2. Revise this sentence: "Whether it's a short-lived bout or a chronic condition, finding effective treatment options is crucial for managing these infections and relieving their symptoms to: "Whether it presents acutely or as a chronic condition, discovering effective treatment options is vital for handling these infections and alleviating their symptoms."
3. Revised this sentence "Copper nanoparticles, as the name suggests,)" to : "Copper nanoparticles, as their name implies, are minute copper particles at the nanoscale that showcase distinct properties and characteristics."
4. Revise the paragraph: "23. Mechanisms of Action of Copper Nanoparticles against Viral Infections" to include the following information and support it with references: "Copper nanoparticles have several mechanisms through which they combat viral infections:
 - a. Direct Interaction: They can interact directly with the viral structure, disrupting its outer membrane or genetic material, preventing the virus from infecting host cells.
 - b. Antiviral Activity: Copper nanoparticles can exhibit inherent antiviral properties, inhibiting viral replication or binding to specific viral components, thereby halting their ability to cause infection.
 - c. Immunomodulation: They might stimulate the immune system's response, enhancing the body's ability to recognize and neutralize viruses.
 - d. ROS Generation: Copper nanoparticles can generate reactive oxygen species (ROS) when in contact with viruses.

These ROS can damage the viral structure, impeding their ability to infect cells.

- e. Inhibition of Viral Enzymes: They might interfere with viral enzymes critical for the replication process, hindering the virus's ability to multiply and spread.
 - f. Preventing Viral Attachment: Copper nanoparticles can prevent viruses from attaching to host cells by altering the viral surface or receptor sites, reducing the likelihood of infection.
1. Although this paragraph "3.4. Assessment of Study Quality and Risk of Bias" was well formulated and has a valid scientific significance. However, certain issues could arise in the application or interpretation of the assessment process mentioned:
- a. Subjectivity in Assessment: While standardized tools like the Cochrane Risk of Bias tool or the Newcastle-Ottawa Scale are widely used, their application can sometimes involve subjective judgment, potentially leading to variability in ratings among assessors.
 - b. Potential Limitations of Tools The tools themselves might have limitations in assessing certain study designs or biases, which could affect the accuracy of the quality assessment.
 - c. Weighting of Studies: The statement suggests that studies with high quality and low risk of bias were given greater weight in the analysis. While prioritizing high-quality studies is reasonable, the method and justification for assigning greater weight should be explicitly defined to avoid potential biases in the analysis.
 - d. Inadequate Explanation: The paragraph lacks details on how the assessments were conducted, the criteria used, or how disagreements among assessors were resolved, which could impact the reliability of the quality assessment.
1. In the same context, while the paragraph:"4.3. Impact of Copper Nanoparticles on Viral Load and Symptom Relief" doesn't inherently present scientific problems. However, potential concerns or areas for improvement might include:
- a. Clarity in Intervention Description: The paragraph mentions comparing the intervention group (receiving copper nanoparticles) to the control group (receiving a placebo or alternative treatment). It would be beneficial to provide more specifics about the alternative treatments or placebos used in the control group to ensure a clear understanding of the comparisons made.
 - b. Standardization of Interventions: Ensuring consistency in the administration of copper nanoparticles or alternative treatments across different studies (if multiple studies were included) is essential for accurate comparison and interpretation of results.
 - c. Measurement of Viral Load and Symptoms The methodology for assessing viral load and symptom relief needs to be specified. Variability in measurement techniques or tools used across studies could impact the reliability and comparability of the results.
 - d. Publication Bias and Study Heterogeneity: The paragraph doesn't mention addressing potential publication bias or study heterogeneity, which could affect the overall findings and conclusions drawn from the analysis.
 - e. Contextualization of Results: While the paragraph describes the comparison between intervention and control groups, additional context about the clinical significance of observed changes in viral load and symptom relief would be beneficial to understand the practical implications of the findings.

1. Regarding the paragraph: "5.1. Potential Adverse Effects of Copper Nanoparticles", there are a few scientific concerns:
 - a. Lack of Specificity: The author(s) discuss possible side effects of copper nanoparticles for viral skin infections, such as skin irritation, redness, or itching, yet lacks precise information regarding how often they occur, how severe they are, or detailed documentation of these effects.
 - b. Incomplete Information: While it indicates that studies have suggested the safety of using copper nanoparticles, it doesn't specify the nature or scope of these studies, such as their sample size, duration, or methodology. Providing details about the studies supporting the safety claim would bolster the credibility of the statement.
 - c. Absence of Risk Assessment: The author(s) downplays the potential side effects as usually mild and transient. A more comprehensive risk assessment, including potential rare or severe adverse effects and their management, would offer a more balanced view of the safety profile of copper nanoparticles.
 - d. Need for Context: The statement lacks context regarding the risk-benefit ratio. While highlighting potential side effects is essential, it's crucial to discuss them within the context of the treatment's overall efficacy and benefits.

I believe that addressing these points would significantly enhance the manuscript's scientific rigor and readability. The study has the potential to contribute substantially to the field of dermatology and nanomedicine.

Thank you for considering my feedback. I look forward to seeing the revised version of this manuscript and its contributions to the scientific literature.

Sincerely,

The reviewer

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