Review of: "Air Swallowing and Breathing Exercises Reduce the Severity of Acute Gastroesophageal Reflux Symptoms and Give a Clue into the Role of Oxygen in Digestion: A Case Report with Extended Discussion"

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Potential competing interests: No potential competing interests to declare.

The abstract presents several strengths, including a clear presentation of the case report and the innovative use of oxygen therapy for managing gastroesophageal reflux symptoms (RS). The study systematically investigates the role of oxygen, providing evidence through air swallowing and breathing exercises (ASBE), which demonstrate promising results in alleviating RS symptoms. Additionally, the comparison of oxygen oxidation potential to antioxidant content in refluxogenic foods adds depth to the understanding of the proposed mechanism. The hypothetical oxygen model for digestive reflux offers a novel perspective on the pathophysiology of RS. However, the abstract also has shortcomings, notably the lack of larger-scale clinical evidence to support the efficacy of ASBE and the oxygen model. Additionally, the abstract mentions that ASBE only partially resolves RS, suggesting that other factors contribute to the condition, yet it does not delve into these potential confounders or alternative treatment approaches. Further research is needed to validate the findings and explore the broader implications of oxygen therapy in managing RS.

The methods section demonstrates several strengths, primarily in its systematic approach to investigating the efficacy of air swallowing and breathing exercises (ASBE) in managing gastroesophageal reflux symptoms (RS). The use of a case report design allows for a detailed exploration of the patient's experience and the implementation of ASBE over a 50-day period, providing valuable insights into its potential benefits. The scoring system used to assess RS symptoms, though simple, offers a standardized method for tracking symptom severity and response to treatment. Moreover, the inclusion of supplementary material detailing the days when ASBE was not feasible due to timing constraints adds transparency to the study design and accounts for potential confounding variables.

However, the methods section also exhibits some limitations. The lack of a control group or comparative intervention limits the ability to draw definitive conclusions about the efficacy of ASBE. Without a comparison to standard treatment options or a placebo group, it is challenging to attribute improvements in RS solely to ASBE. Additionally, the absence of blinding introduces potential bias, as both the patient and researchers are aware of the intervention being administered. This lack of blinding may influence subjective symptom reporting and treatment outcomes. Furthermore, the methods section does not detail any measures taken to monitor adherence to ASBE protocols or potential variability in technique between sessions, which could impact the consistency and reliability of results.

In the results section, several strengths and limitations are apparent. The detailed description of RS symptom outcomes

following ASBE sessions provides a comprehensive overview of treatment response over the 34-day period. The data illustrate a consistent pattern of temporary relief and reduction in RS severity following ASBE, with notable improvements in symptom management compared to baseline. The inclusion of figures depicting RS symptom trajectories after each ASBE session enhances the clarity and visual representation of the results. Moreover, the acknowledgment of potential confounding factors, such as the natural course of RS symptoms over time and the variability in response to ASBE, adds nuance to the interpretation of findings.

However, the results section also has some shortcomings. The absence of statistical analysis or quantification of effect sizes limits the strength of conclusions that can be drawn from the data. Without formal statistical testing, it is challenging to determine the significance of observed changes in RS symptoms or the magnitude of treatment effects. Additionally, the reliance on subjective symptom reporting without objective measures of RS severity introduces potential bias and reduces the robustness of the findings. Future studies could benefit from incorporating objective outcome measures, such as pH monitoring or esophageal motility studies, to supplement self-reported symptom data and provide a more comprehensive evaluation of treatment efficacy.

While the discussion section offers a thorough exploration of the potential mechanisms underlying the observed reduction in reflux symptoms (RS) with air swallowing and breathing exercises (ASBE), there are some shortcomings that warrant attention. Firstly, the discussion relies heavily on theoretical models and extrapolation from existing literature, which may introduce uncertainty regarding the specific mechanisms underlying the observed effects of ASBE. To address this limitation, the discussion could benefit from more empirical evidence to support the proposed hypotheses. Conducting controlled experiments or clinical trials specifically designed to investigate the effects of ASBE on oxygen availability, reflux events, and digestive processes would strengthen the validity of the proposed mechanisms.

Additionally, the discussion could provide a more balanced interpretation of the findings by addressing potential confounding factors and alternative explanations for the observed outcomes. By acknowledging the limitations of the current study design and considering alternative hypotheses, the discussion would enhance the robustness of its conclusions. Furthermore, the discussion should be careful not to overstate the implications of the findings or make unsupported claims about the causal relationships between ASBE, oxygen availability, and RS. Emphasizing the preliminary nature of the proposed oxygen model and the need for further research to validate its predictions would help temper expectations and provide a more nuanced understanding of the complex interactions involved.

In the conclusion section, there is a need for greater clarity and specificity regarding the implications of the findings and the recommendations for future research. The conclusion should succinctly summarize the key findings of the study, emphasizing the observed effects of ASBE on RS and oxygen availability in the gastrointestinal (GI) tract. Additionally, the conclusion could outline specific avenues for future research, such as controlled experiments to investigate the mechanisms underlying the observed effects of ASBE and clinical trials to evaluate its efficacy as a treatment for reflux symptoms. By clearly articulating the implications of the study findings and providing actionable recommendations for future research, the conclusion would enhance the overall impact and relevance of the study.

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