

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.

Strengths:

- **Unique observation:** The report highlights the unexpected relief from GERD symptoms after exposure to hydrogen peroxide, leading to the investigation of oxygen's potential role.
- **Intervention and outcome:** The study demonstrates that air swallowing and breathing exercises (ASBE) can provide temporary relief from GERD, suggesting a potential therapeutic avenue.
- **Hypothetical model:** The proposed oxygen model for digestive reflux offers a new perspective on the potential mechanisms underlying GERD.

Areas for improvement:

- **Limited sample size:** The study relies on a single case report, making it difficult to generalize the findings to a wider population.
- **Mechanism of action:** While the oxygen model is intriguing, further research is needed to elucidate the specific mechanisms by which ASBE influences GERD symptoms.
- **Control group and blinding:** Lack of a control group and blinding limits the ability to definitively attribute the observed relief to ASBE and exclude placebo effects.
- **Quantitative analysis:** The analysis of oxygen potential based on swallowed air volume lacks detailed calculations and consideration of individual factors like respiratory rate and oxygen absorption efficiency.
- **Addressing limitations:** The report acknowledges that ASBE doesn't resolve all GERD episodes, but further investigation into the factors contributing to the remaining 26% is needed.

Additional considerations:

- **Literature review:** A more comprehensive review of existing literature on the role of oxygen in digestion and its potential link to GERD could strengthen the case for the proposed model.
- **Physiological factors:** Exploring the potential influence of other physiological factors like esophageal sphincter dysfunction, gastric motility, and mucosal integrity on the effectiveness of ASBE would be valuable.
- **Clinical trial design:** Future research should involve well-designed clinical trials with larger sample sizes, control

groups, and blinding to establish the efficacy and safety of ASBE as a GERD treatment.

, this case report presents a thought-provoking hypothesis and paves the way for further research into the potential role of oxygen in GERD management. However, additional studies with robust methodologies are crucial to validate the proposed model and translate it into a clinically applicable intervention.

The error you identified in the original text lies in the assumption that the stomach is full of oxygen. Here's a breakdown of the correction needed:

Error:

- The text states, "The hypothesised oxygen model for digestive reflux. Reflux of digesting food to the more oxygenated oesophageal regions is triggered by refluxogenic foods like coffee and orange juice which are high in antioxidants that react with oxygen in the lumen, to create a lack of oxygen in regions of the gut, initiating reflux of digesting food to regions of higher oxygen content to increase oxygen supply and prevent cellular hypoxia or anoxia."

This model implies that the stomach has a significant amount of oxygen available for reactions with food contents.

Correction:

- The stomach environment is primarily acidic (pH 1.5 to 3.5) due to the presence of strong digestive acids. This acidic environment is inhospitable to most aerobic organisms, including those potentially involved in digestion.
- Oxygen plays a minimal role in stomach digestion. While oxygen is crucial for various biological processes, its direct involvement in stomach food breakdown is limited.
- The esophagus is not designed for digestion and has limited oxygen absorption capabilities.

Therefore, the proposed model suggesting reflux is caused by a lack of oxygen in the esophagus due to consumption by antioxidants in refluxed food is inaccurate.

Here's an improved explanation based on the corrected understanding:

Revised Model:

- Reflux of digesting food to the more oxygenated esophageal regions might be triggered by the presence of refluxogenic foods high in antioxidants. These antioxidants can react with oxygen in the esophageal lumen, potentially creating a localized oxygen deficit compared to the oxygen demand required for optimal digestion in the stomach.
- This oxygen deficit in the esophagus could, in theory, initiate the reflux of digesting food to regions with higher oxygen content, potentially the stomach or even the upper esophagus, to facilitate oxygen supply and prevent cellular stress or damage.

It's important to note that this revised model remains hypothetical and requires further investigation. While ASBE might provide some relief for GERD symptoms, the exact mechanisms underlying its effectiveness are not fully understood.

This research offers a new perspective on reflux and gut health, potentially leading to innovative treatment

approaches in the future.