

**Reviewer Name:** Steven Brantlov

**Date:** September 2024

**Manuscript Title:** A matched case-control study to evaluate phase angle as a marker of mortality risk in elderly patients with multimorbidity

**Manuscript ID:** #99618

**Journal Name:** PeerJ

**GENERAL:**

**1. Scope**

The paper is within the scope of PeerJ.

**2. Originality**

The paper describes the use of bioelectrical impedance analysis (BIA) in elderly patients with multimorbidity, thus filling a gap in the literature.

**3. Writing**

The paper is well-written and well communicated. However, some English mistakes should be corrected before a possible publication.

**4. Length**

The paper is not too long. However, as described below, I need more clarifying information, which will probably make it a bit longer.

**5. Recommendation**

My comments below must be specified/answered before the paper can be considered for publication in PeerJ.

**6. Summary of Review**

Major revisions required.

**PAPER:**

**1. Title**

The current title is good, but due to the focus of the paper, the title could be improved by changing it to: "Phase angle as a predictor of mortality in elderly patients with multimorbidity: a matched case-control study"

**2. Abstract**

Suggestions:

- Please add why the paper ended up with 30 patients after 121 that met the inclusion criteria.
- Specify the brand/model of the BIA device used in the study.
- Are there any PhA cutoff values of interest for the reader that could be reported?

**3. Keywords**

No further suggestions.

**4. Introduction**

Suggestions:

- Line 46/47: Please add a reference for "Another characteristic of 47 elderly patients is their altered nutritional status".
- Line 56/58: Change from "running a weak current ..." to "sending a weak current ..."

- Line 62/64: Change to “Phase angle (PhA) is a BIA-derived parameter that reflects cell integrity and water distribution within and outside the cell. It is calculated as the ratio  $X_c/R$  in degrees ( $^\circ$ ), where resistance (R) measures how easily electrical currents pass through tissues, and capacitive reactance ( $X_c$ ) represents the cells' ability to store and release energy”. See also comments in the discussion section.

## 5. Methods

Suggestions:

### *Patients*

- Explicitly mention that this is a matched case-control study.
- Include the total number of patients and group sizes (death and survival groups).

### *BIA measurements*

- Please specify how the different BIA parameters were determined: own developed prediction equations or the in-built equations of the InBody device?
- Please also specify whether these prediction equations are relevant to the group of patients studied in your paper.
- Standardisation of the measurement procedure is paramount to ensure valid results. Please specify the type of device (lead-type vs. stand-on device), placement of the electrodes, calibration, operator, etc.
- See also the following papers for important factors to report in a research paper.
  - *Bioelectrical impedance analysis-part II: utilisation in clinical practice*: Ursula G Kyle 1, Ingvar Bosaeus, Antonio D De Lorenzo, Paul Deurenberg, Marinos Elia, José Manuel Gómez, Berit Lilienthal Heitmann, Luisa Kent-Smith, Jean-Claude Melchior, Matthias Pirlich, Hermann Scharfetter, Annemie M W J Schols, Claude Pichard; ESPEN
  - *Critical factors and their impact on bioelectrical impedance analysis in children: a review*: Steven Brantlov, Leigh C. Ward, Lars Jødal, Søren Rittig & Aksel Lange
  - *Standardisation of bioelectrical impedance analysis for the estimation of body composition in healthy paediatric populations: a systematic review*: Steven Brantlov, Lars Jødal, Aksel Lange, Søren Rittig & Leigh C. Ward

### *Blood tests*

- Please add information about the type of device used for blood tests and when the tests were done.

### *Statistically analysis*

- Please specify how the normality of the data was determined, e.g., statistical test.
- Which statistical software package was used?

## 6. Results

Suggestions:

- Please ensure the tables are presented in the results section so readers can easily reference them. For example, “Table 1 summarises the comparison of baseline data between the death and survival groups”.
- Please report the actual PhA values (including R and  $X_c$  values) as mean  $\pm$  SD in Table 3. This enhances their practical application in prognostic assessments and provides a precise cutoff for mortality risk prediction.

## 7. Discussion

Suggestions:

- Line 167/178: The text does not discuss; it only lists historical facts/events. This text should be used in the introduction and/or methods sections. If included in the discussion section, please discuss it in relation to your results.
- Line 179/181: Why are mean PhA values reported in the discussion when they are not presented earlier, e.g., in the results section? Why are they now relevant? Please specify.

- I suggest that your discussion should be improved if it is structured chronologically from following topics:
  1. Briefly restate your most important results.
  2. Compare findings with other studies, highlighting similarities or differences.
  3. Explain potential biological or clinical mechanisms behind your results.
  4. Highlight the strengths of your study design.
  5. Acknowledge limitations that may affect interpretation.
  6. Discuss the practical relevance for clinicians (or patients).
  7. Suggest areas for further research based on gaps or questions that are not answered in your paper.

## **8. Conclusion**

Suggestions:

- Are you sure about your conclusion that “It can be used for early detection of malnutrition in geriatric patients, enabling early intervention and improving patient prognosis and quality of life”? Is there no need for further studies?

## **9. Figures and Tables**

Suggestions:

- Please specify definitions of the abbreviated parameters (T-value = t-test, B-value, etc.), and that data are mean  $\pm$  SD. Remember that the reader should be able to understand figures and tables without searching for explanations in the text in the paper.

## **10. References**

Suggestions:

- Papers that discuss the importance of standardisation of BIA measurements – see methods section.
- Paper of relevance to read: *Bioelectrical impedance analysis for body composition assessment: reflections on accuracy, clinical utility, and standardisation*, Leigh C. Ward, European Journal of Clinical Nutrition volume