Peer Review Report

Review Report on Role of albumin and prealbumin in assessing nutritional status and predicting increased risk of infectious complications during childhood cancer treatment

Original Research, Acta Biochim. Pol.

Reviewer: Anna Synakiewicz
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EVALUATION

Q 1 **Please summarize the main findings of the study.**

The article addresses important issues related to the assessment of nutritional status in children, particularly in oncology patients, using key indicators such as albumin, prealbumin, and Upper Arm Muscle Area (UAMA). The publication presents their significance in identifying malnutrition risk and its connection with increased susceptibility to infectious complications, which is especially crucial for immunocompromised children undergoing cancer therapy.

The authors begin by discussing albumin as an indicator of long-term nutritional status and the body's protein reserves. They emphasize that low albumin levels in oncology patients are highly correlated with protein deficiencies, leading to impaired immune function and increased infection risk. This well-documented phenomenon deserves special attention in the context of children, where nutritional deficiencies can significantly affect prognosis and treatment response. The discussion about the limitations of albumin as a nutritional marker, especially in cases of inflammation, which can lead to artificially lowered results, is also valuable.
Prealbumin, with a shorter half-life than albumin, is rightly identified as a more dynamic marker of short-term nutritional changes. The article argues that prealbumin can better reflect rapid shifts in nutritional status, which is crucial in the treatment of pediatric oncology patients who require intensive nutritional support. Despite this, the authors note that prealbumin, like albumin, can also decrease in inflammatory states, which must be considered when interpreting results.

The measurement of Upper Arm Muscle Area (UAMA) is presented as an important tool for assessing lean body mass, particularly muscle mass, which is a crucial element of metabolic and immune health. The authors demonstrate that a reduction in UAMA is associated with cancer-related cachexia and muscle catabolism caused by the disease and its treatment, leading to weakened overall physical condition and greater vulnerability to infections. Highlighting muscle mass loss as an indicator of infectious complication risk in oncology patients is an important and insightful observation that sheds light on the need for comprehensive nutritional assessments.

Q 2 **Please highlight the limitations and strengths.**

One of the article's strengths is its interdisciplinary approach, combining clinical, nutritional, and in some matter immunological perspectives. The authors support their claims by referencing actual studies and analyses, enhancing the credibility and reliability of their conclusions. They emphasize the importance of regularly monitoring the nutritional status of oncology patients using the discussed markers, which allows for early detection of deficiencies and the implementation of effective nutritional interventions.

Despite its many strengths, the article could have more extensively discussed specific nutritional intervention strategies for children with low levels of albumin, prealbumin, or reduced muscle mass. Additional information on the optimal methods of nutritional support during cancer treatment could have enriched the practical application of the research findings.

The article lacks a table presenting patient data, particularly histopathological diagnoses, which limits the clarity of the patient cohort analyzed. Although the authors cite an ongoing study currently awaiting publication, the absence of this crucial data leaves gaps in understanding the variety of diagnoses and their potential impact on the study's findings. Additionally, the lack of analysis on whether certain treatment aspects, such as prolonged steroid therapy, could have influenced the results is a significant omission. Steroid therapy, known for its impact on metabolism and muscle mass, could skew the nutritional assessment markers, and the absence of such considerations limits the depth of the article's conclusions.
No information about the type of infection was found. It should be presented as well, together with analysis in discussion.

Q 3 **Please comment on the methods, results and data interpretation. If there are any objective errors, or if the conclusions are not supported, you should detail your concerns.**

The description authors provided outlines a typical statistical methodology section of a research study, but there are some aspects that could be clarified or adjusted to ensure accuracy and consistency. The description of numerical variables using mean, standard deviation, median, quartiles, and range is standard practice. It allows for a thorough summary of central tendency (mean/median), spread (standard deviation, quartiles), and extreme values (range). However, it's important to note that the mean and standard deviation are typically used for data that follow a normal distribution, while median and quartiles are more appropriate for non-normally distributed data.
For the proportion tests: the description is vague here. It could be referring to tests that compare proportions between groups, such as a Z-test for proportions or similar. It would be clearer to specify which type of proportion test is used.
Describing the use of single-variable linear regression to assess whether prealbumin, albumin deficiency, or low UAMA percentile predicts infectious complications is conceptually valid if those variables are continuous. Linear regression works to model the relationship between one predictor (independent variable) and an outcome (dependent variable). However, if infectious complications are binary (e.g., presence or absence of an infection), logistic regression would be more appropriate than linear regression. If complications are continuous (e.g., the number of complications), then linear regression would be appropriate.
Overall, the statistical methods are described adequately for the most part, but there are a few points that need clarification, particularly regarding regression analysis for binary outcomes and proportion tests. Additionally, ensuring the use of mean and standard deviation for normally distributed data, and median and quartiles for skewed data, should be confirmed based on the actual dataset used.

Check List

Q 4 **Please provide your detailed review report to the editor and authors (including any comments on the Q4 Check List)**

The discussion section requires significant revision to align more closely with the parameters that were analyzed in the study. Currently, the discussion lacks sufficient detail in explaining how the key variables (e.g., prealbumin and albumin deficiency, UAMA percentiles) are associated with infectious complications during treatment. It is important to provide a more nuanced interpretation of the findings.
This comment aims to guide the authors in making the discussion more reflective of their analytical approach and findings.

- Please correct affiliations as they are the same for Anna Milaniuk and Katarzyna Drabko (it should be the same affiliation number)
- Please correct the mistake in line 28: it should be “Additionally” instead of “Additinally”
- I suggest to remove sentence form line 106: “ Controls were recruited from among the children of relatives and friends of the investigators”

Q 5 **Is the English language of sufficient quality?**

Yes.

Q 6 Is the quality of the figures and tables satisfactory?

No.

Q 7 Does the reference list cover the relevant literature adequately and in an unbiased manner?

Yes.

Q 8 Are the statistical methods valid and correctly applied? (e.g. sample size, choice of test)

Yes.

Q 9 Are the methods sufficiently documented to allow replication studies?

Yes.

Q 10 Are the data underlying the study available in either the article, supplement, or deposited in a repository? (Sequence/expression data, protein/molecule characterizations, annotations, and taxonomy data are required to be deposited in public repositories prior to publication)

Not Applicable.

Q 11 Does the study adhere to ethical standards including ethics committee approval and consent procedure?

Yes.

Q 12 Have standard biosecurity and institutional safety procedures been adhered to?

Not Applicable.

QUALITY ASSESSMENT

Q 13 Originality

Q 14 Rigor

Q 15	Significance to the field	
Q 16	Interest to general audience	
Q 17	Quality of the writing	
Q 18	Overall quality of the study