Innovative Journal of Pediatrics
Volume 34 · Issue 5 · e148382

OPEN PEER REVIEW

Validity of Different Anthropometric Indices in the Assessment of Body Composition of Children and Adolescents with Type 1 Diabetes

Yavuz Ozer, Didem Gunes Kaya, Emine Ulgen, Mehmet Enes Gokler, Oya Ercan

SUBMITTED	REVISED	ACCEPTED	DOI
29 Apr 2024	18 Jun 2024	28 Jun 2024	10.5812/ijp-148382

About this report

This open peer review (OPR) report shows the public comments made on this article during peer review, by the reviewers, the associate editor and the editor-in-chief, for every revision round, together with the authors' replies. Comments appear only with the consent of the people who wrote them. Reviewers who chose to sign their report are named; the others are shown as "Referee". Comments are edited for language only, and confidential remarks to the editors are not included.

More about open peer review: brieflands.com/knowledgebase/opr

Contents

1 **Original submission** Referee 1 2
2 **Revision 1** Referee 1 3
Authors' reply to reviewers 4
Reviewer and editor comments 10

1 Original submission

1 comment · 31 May 2024

Referee 1 Reviewer

MAJOR REVISION 31 May 2024

Thank you. It is necessary to pay attention to the following items.
1- What is the reason for choosing children between the ages of 5 and 21?
2- How was the sample size calculated? Please specify.
3- The exclusion criteria are incomplete. Please correct them.
4- Various factors play a role in anthropometric indices but are not mentioned in this article, such as the economic status of the patient's family, the parents' level of education, urban or rural residence, the amount of physical activity, etc.
5- In the article, the relationship between insulin intake and anthropometric indices is not mentioned.

2

Revision 1

AUTHORS' RESPONSE TO REVIEWERS

Authors' reply to reviewers

The next pages contain the authors' point-by-point reply to the comments of this revision round, as submitted with the revised manuscript. It is published as the authors wrote it.

Dear Editor,

Thank you for providing the opportunity to address the valuable comments and suggestions from the reviewers. We appreciate your guidance and support throughout the revision process. We have carefully considered and incorporated the feedback to enhance the quality of our manuscript.

Dear Reviewer 1,

Thank you for your valuable comments and suggestions. We appreciate the time and effort you have put into reviewing our manuscript. Below are our responses and the corresponding revisions made to the manuscript:

1- What is the reason for choosing children between the ages of 5 and 21?

Response: The age range of 5 to 21 years was selected based on the guidelines provided in the user manual of the Tanita MC-780 MA device, which specifies an applicable age range from 5 to 99 years. Available from: https://www.tarti.com/kullanim-kilavuzlari/mc-780.pdf.

2- How was the sample size calculated? be mentioned.

Response: The sample size was determined based on the inclusion criteria and the duration of the study. The following sentence was added in the methods section: “Patients who met the inclusion criteria during the study period were included using simple random sampling.”

3- Exclusion criteria is incomplete. be corrected.

Response: The following text was revised: “Inclusion criteria were as follows: (1) Ages 5-21 years, (2) diagnosis of T1D with at least 2 positive autoantibodies (IAA, ICA, and anti-GAD) positivity, (3) insulin treatment for at least 1 year.

Exclusion criteria were as follows: (1) Being under 5 years and above 21 years, (2) diagnosis of Maturity Onset Diabetes of the Young (MODY), type 2 diabetes, or other forms of secondary diabetes, and (3) presence of any additional chronic disease, such as autoimmune diseases, or celiac diseases, or chronic kidney disease.”

4- Various factors play a role in anthropometric Indices that are not mentioned in this article, such as the economic status of the patient's family, the level of education of the parents, urban and rural, the amount of physical activity, etc.

Response: Thank you for your comment. We acknowledge that various factors such as economic status, parental education level, and physical activity can influence anthropometric indices. We recognize that these additional factors were not the primary focus of our current research and thus were not thoroughly examined. Future research could certainly explore these additional factors in greater depth to provide a more comprehensive understanding. The following text was revised: “A cross-sectional study was conducted, including children and adolescents aged between 5 and 21 years, who had been followed up with a diagnosis of T1D for at least 1 year and residing in the urban area, on a voluntary basis.”

5- In the article, the relationship between insulin intake and anthropometric indices is not mentioned.

Response: Thank you for pointing out these factors. Indeed, all participants included in our study had completed the honeymoon period and were currently using insulin. The variability in insulin dosage per kilogram per day may be influenced by factors such as age and pubertal status (prepubertal/pubertal), which were considered during participant selection and analysis. It's important to note that our study did not specifically investigate the relationship between insulin intake and anthropometric indices. Instead, our focus was on anthropometric indices in children with T1D. Future research could explore how these factors impact insulin requirements and their implications on anthropometric measurements.

Dear Reviewer 2,

Thank you for your thoughtful comments and suggestions. We appreciate the time and effort you have put into reviewing our manuscript. Below are our responses and the corresponding revisions made to the manuscript:

ABSTRACT

1- The results section and conclusion were vague and not precise. AUC values are useful for expression of power of new methods. Furthermore, the accurate expression of sensitivity, PPV and NPP and accuracy, Status and forecast (reality and observed) all subjects by all modalities must be noted for accurate judgment.

Response: We have carefully revised the Results and Conclusion sections to address your feedback and improve the precision of our findings. The following text was revised: “**Results:** Our study included 133 subjects (48.1% male, 77.4% pubertal) with a median age of 14.0 years (11.3-16.5) and a median duration of T1D of 4.5 years (1.5-7.3). The prevalence of overweight/obesity was 21.8% according to BMI-SDS and 30.1% according to BIA. BMI-SDS, WC, WHtR, TMI, AVI, BRI, and BAI were effective methods in differentiating overweight/obesity. BMI-SDS demonstrated a sensitivity of 78.79%, a positive predictive value of 72.22%, a negative predictive value of 89.71%, and an AUC of 0.895 at a cut point of 0.63, highlighting its effectiveness in distinguishing overweight/obesity. **Conclusion:** In children and adolescents with T1D, the prevalence of obesity/overweight identified using BIA was significantly higher compared to BMI-SDS. When reference methods are unavailable, BMI-SDS is the optimal anthropometric method for determining overweight/obesity, in this population, independent of sex and puberty. These findings suggest that BMI-SDS can be a reliable alternative for body composition assessment, ensuring accurate identification and management of overweight/obesity.”

Introduction

2-Introduction section needs revision, totally. It likes the lecture note! The first paragraph needs to summarize.

Response: We have revised the introduction section based on your suggestions. Here is the revised first paragraph summarizing the introduction: “In recent years, despite advancements in the management of type 1 diabetes (T1D), the prevalence of overweight and obesity among young individuals with T1D has been on the rise. The prevalence of overweight and obesity according to body mass index (BMI), has been reported to be 31.8-39% in children and adolescents with T1D (1–3). While intensive insulin therapy has improved metabolic control

and reduced vascular complications in T1D, exogenous insulin exposure contributes to a hyperinsulinemic environment, potentially promoting lipogenesis and increasing body fat percentage (PBF) (4,5). The increased prevalence of obesity and central adiposity leads to associated cardiovascular comorbidities, including insulin resistance in the long term. Consequently, there has been a growing focus on body composition (BC) among young individuals with T1D over the past two decades (5–8). Analyzing BC may help identify increases in fat mass that contribute to diabetes-associated cardiometabolic risk (5).”

3-It is suggested that emphasis on the limitations of previous studies (I did not see). You should be focused on finding of previous study and emphases on the limitations of them then note the novelty of your study.

Response: In response to your suggestion, we have revised the Introduction section to include an emphasis on the limitations of previous studies. Specifically, we have added the following sentence: " Previous studies have predominantly utilized BMI to assess body composition and identify overweight and obesity in individuals with T1D.”

Methods

4- What was sampling methods?

Response: “Simple random sampling”

5- How did you calculate the sample size? Which formula? Explain it.

Response: The sample size was determined based on the inclusion criteria and the duration of the study. The following sentence was added in the methods section: “Patients who met the inclusion criteria during the study period were included using simple random sampling.”

6- How did they recruit these babies? Did they use any kind of advertisement / incentive? It is not clear how the authors provided the mentioned test (bioelectrical impedance analysis (BIA), values) to the patients. Did the patients purchase them or did the authors provide the medication? If the 2nd scenario is valid, who sponsored the cost of the medications?

Response: “Bioelectrical impedance analysis tests were conducted free of charge during routine clinical follow-ups, as the hospital owned the equipment and no external sponsorship or funding was required for these measurements.”

Results

7- This format of results section was not organized and difficult to follow. It needs revision totally should be summarized in one or two tables. The contents of the tables should not be repeated in the text. Instead, a reference to the table number may be given (especially paragraph two).

Response: We have revised the results section to improve organization and readability. Specifically, we have summarized the contents into two tables and minimized repetition in the text.

Discussion

8- This section needs revision, totally. In first paragraph, in the discussion part you should write the main(s) finding(s) and specially (novelty) at first and then allude to other studies.

Response: In the first paragraph of the discussion section, we have now highlighted the main findings of our study, particularly emphasizing the novel contributions. The following text was revised in the discussion section: “We found that the prevalence of overweight and obesity in children and adolescents with T1D is significantly high, with BMI-SDS being the most effective anthropometric measure for identifying overweight/obesity. This study is the first to investigate the potential relationship between BIA and novel anthropometric indices in this population. Our findings reveal that the prevalence of overweight/obesity was higher when assessed using BIA compared to BMI-SDS, with rates of 21.8% and 30.1%, respectively. This highlights the potential underestimation of obesity when relying solely on BMI.”

9- The clinical statement of study should be expressed in more details.

Response: The following text was added in the discussion section: “A recent meta-analysis reported that body fat was 9% higher in children with T1D (20). Additionally, it has been demonstrated that BC measurement has predictive value in cardiovascular risk assessment in youth with T1D (21). Accurate assessment of overweight and obesity is essential for early intervention and prevention of cardiovascular comorbidities associated with T1D.”

10- Many sentences in this section were repetitive and belong to the background section (especially in first and second paragraph). The authors should be expressed the main finding, briefly but precise.

Response: To eliminate redundancy and ensure clarity, we have carefully reviewed the text to avoid repetition and unnecessary overlap with the background section. In particular, we have streamlined the discussion to focus on key findings and their implications.

10- The clinical statement of study should be expressed in more details.

Response: The following text was added in the discussion section: “A recent meta-analysis reported that body fat was 9% higher in children with T1D (20). Additionally, it has been demonstrated that BC measurement has predictive value in cardiovascular risk assessment in youth with T1D (21). Accurate assessment of overweight and obesity is essential for early intervention and prevention of cardiovascular comorbidities associated with T1D.”

Dear Associate Editor,

We appreciate your feedback and have made our best to accommodate major revisions as suggested for resubmission.

Associate Editor 1:

Your manuscript was reviewed by our reviewers. The reviewers have raised concerns regarding the manuscript, and therefore, your paper is not acceptable for publication in this format. However since the reviewers do find some merit in the paper, I would be willing to

reconsider if you wish to undertake major revisions and re-submit, addressing the referees' concerns.

Please note that resubmitting your manuscript does not guarantee acceptance, and that your resubmission will be subject to a re-review before a decision is rendered.

Please consider following comments in the new revision:

- Please provide more details on the specific BIA device used, its validation, and the equations/reference data employed for interpreting the BIA results.

Response: The following text was added in the methods section: “This device is known for its high accuracy and reliability in estimating BC parameters (14). It has been validated against gold-standard methods such as DXA and hydrostatic weighing (9). The BIA results were interpreted using the manufacturer’s proprietary algorithms, which take into account variables such as age, sex, height, weight, and impedance to provide accurate estimates of PBF.”

- While the authors reported the prevalence of overweight/obesity based on BMI-SDS and BIA, they did not provide detailed information on the distribution of participants across different weight categories (underweight, normal weight, overweight, obese). This information could have provided further insights into the performance of the anthropometric indices across different weight categories.

Response: We understand the importance of providing detailed information on the distribution of participants across different weight categories. In our study, to facilitate the ROC analysis and evaluate the performance of the anthropometric indices, we categorized participants into two groups: underweight/normal weight and overweight/obese. This binary classification was necessary for the following reasons:

1.Statistical Power: Combining underweight and normal weight participants into a single group ensured a sufficient sample size for each category, enhancing the reliability and validity of our ROC analysis.

2.Clinical Relevance: The primary objective of our study was to assess the diagnostic performance of anthropometrc indices in identifying overweight and obesity.

- It would be beneficial to include a few more recent references, particularly those published after the study period (2021-2023), to ensure that the discussion and interpretation of findings are contextualized within the latest literature.

We added more recent references:

1.Nsamba J, Eroju P, Drenos F, Mathews E. Body Composition Characteristics of Type 1 Diabetes Children and Adolescents: A Hospital-Based Case-Control Study in Uganda. Children (Basel). 2022 Nov;9(11).

2.Brener A, Hamama S, Interator H, Ben Simon A, Laurian I, Dorfman A, et al. Sex differences in body composition in youth with type 1 diabetes and its predictive value in cardiovascular disease risk assessment. Diabetes Metab Res Rev. 2023 Jan;39(1):e3584.

3.Zheng Y, Rostami Haji Abadi M, Gough J, Johnston JJD, Nour M, Kontulainen S. Higher Body Fat in Children and Adolescents With Type 1 Diabetes-A Systematic Review and Meta-Analysis. Vol. 10, Frontiers in pediatrics. Switzerland; 2022. p. 911061.

2 Revision 1

1 comment · 28 Jun 2024

Referee 1 Reviewer

ACCEPT 28 Jun 2024

Thank you for your explanations and corrections.