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REVIEWER'S REPORT

Manuscript No.: IJAR-56444

Title: Duration of Diabetes as a Determinant of Coronary Artery Calcium Score in Type 2 Diabetes Mellitus: A Cross-Sectional Analysis of Glycemic Exposure and Vascular Calcification

Recommendation:

Accept as it is .....

✓ Accept after minor revision.....

Accept after major revision .....

Do not accept (*Reasons below*) .....

Rating	Excel.	Good	Fair	Poor
Originality		✓		
Techn. Quality		✓		
Clarity		✓		
Significance	✓			

Reviewer Name: Dr S. K. Nath

Detailed Reviewer's Report

Strengths of the Study

- The study addresses an important and clinically relevant question regarding the independent role of diabetes duration in coronary artery calcification among patients with type 2 diabetes.
- Utilizes a well-defined cross-sectional design with appropriate imaging techniques (multidetector CT and Agatston scoring) for quantifying CAC.
- The sample includes a comprehensive assessment of potential confounding factors such as age, gender, HbA1c, lipid profiles, and hypertension, with appropriate statistical adjustments.
- Demonstrates a strong correlation between diabetes duration and CAC, contributing valuable data to the understanding of the temporal progression of vascular calcification in diabetes.
- The findings support the hypothesis that cumulative metabolic injury often surpasses current glycemic control in predicting subclinical atherosclerosis.
- The study aligns with prior literature but adds regional and ethnic context, broadening the applicability of existing evidence.

Weaknesses of the Study

- The limited sample size (n=100) restricts the generalizability and statistical power, particularly for binary outcomes such as high CAC.
- The cross-sectional design precludes establishing causality between diabetes duration and CAC progression.
- The study population is from a single center in India, which may limit applicability across different ethnic or geographical groups.
- Potential selection bias due to purposive sampling may influence the high prevalence of elevated CAC scores.
- The regression models explain a relatively small proportion of variance (R^2=0.14), indicating other unmeasured factors contribute to CAC burden.
- Lack of detailed information on medication use and control of other cardiovascular risk factors, which could confound the results.
- Some tables and figures are not optimally formatted, and additional clarity in presenting data could enhance understanding.

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Reviewer Comments

- **Title and Abstract:** The title clearly reflects the study focus. The abstract is coherent and summarizes key findings well; however, it could benefit from more explicit mention of the study design.
- **Introduction and Objectives:** The background effectively contextualizes the importance of CAC and diabetes duration. The objectives are clearly stated but could be reinforced by emphasizing the novelty or regional relevance more explicitly.
- **Methodology and Statistical Analysis:** The methodology is appropriate but would be strengthened by including details on how confounders like medication use were controlled or recorded. Use of Pearson's correlation and regression analyses is suitable; nonetheless, more explanation of how assumptions were tested (normality, multicollinearity) would be beneficial.
- **Results and Discussion:** Results are well-organized; the strong correlation between duration and CAC is notable. The discussion appropriately aligns with existing literature but occasionally overstates the causality inherent in the cross-sectional design.
- **Conclusion and Implications:** The conclusions are supported by the data but should be tempered to acknowledge the observational nature. The clinical recommendations are reasonable but need further validation.
- **Ethical Clearance:** The manuscript mentions ethical approval and informed consent, aligning with ethical standards. However, specific approval details (institution, clearance number) are not provided and should be included.
- **Language and Formatting:** The language is generally clear, with minor grammatical errors that do not hinder understanding. Some tables and figures could benefit from improved formatting for clarity. References are appropriately cited and relevant.
- **References:** The reference list is comprehensive and up-to-date, supporting the study's claims and contextual framing.