EDITORIAL COMMENT

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HbA1c and Coronary Artery Disease Severity: Insights from SYNTAX Score II in Diabetic Patients

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Ischemic heart disease, the leading global cause of death with 9.1 million fatalities in 2021, disproportionately affects patients with diabetes, amplifying the need to identify modifiable risk factors.[1] The study by Viruthagiri et al.[2] published in this issue of the International Journal of the Cardiovascular Academy, provides robust evidence linking glycemic control to the anatomical severity of coronary artery disease (CAD) in a diabetic cohort. The authors conducted a prospective observational study of 121 diabetic patients with angiographically confirmed CAD at SRM Medical College Hospital in India. The study utilized the SYNTAX score II (SSII)—which stratifies disease complexity into low (<22), intermediate (23-32), and high (≥33) risk categories—to determine the relationship between metabolic parameters and coronary complexity.[2]

The Aggressive Link: Glycated Hemoglobin (HbA1c) and High-risk CAD

The findings confirm that poor metabolic control correlates directly with advanced coronary disease. Patients exhibited a high mean HbA1c level (8.53±1.68%), which significantly predicted severe CAD ($P = 0.040$). Crucially, each 1% increase in HbA1c raised the odds of belonging to the high-risk SSII group by 62.9% [odds ratio (OR) =1.62, $P = 0.014$].

This relationship is not isolated; the analysis underscores a pervasive cardiorenal-metabolic interplay. Longer diabetes duration (OR =1.13, $P = 0.049$); reduced left ventricular ejection fraction (LVEF) (OR =0.0004, $P = 0.019$); and declining creatinine clearance (OR =0.96, $P = 0.001$) were also identified as independent predictors of worsening SSII (Table 1). These results strongly align with global evidence linking chronic hyperglycemia to accelerated atherosclerosis via endothelial dysfunction and inflammation.[3]

Therapeutic Mandate

The utility of the SSII in risk stratification supports its vital role in guiding revascularization decisions (percutaneous coronary intervention vs. coronary bypass grafting). The study compellingly highlights HbA1c as a critical therapeutic target; achieving and maintaining tight glycemic control is essential to mitigate the progression of complex coronary anatomy. Furthermore, the strong associations involving LVEF and creatinine clearance support integrated cardiorenal management to address the systemic nature of the disease in patients with diabetes.

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***Table 1: Association between key risk factors and severe coronary disease (SYNTAX score II ≥33)**

Risk comparison	Independent risk factor	Odds ratio	*P*-value	Clinical implication
Low-risk vs. high-risk	1% increase in HbA1c	1.63	0.014	Poor glycemic control increases the odds of having the most severe CAD by approximately 63%
Low-risk vs. high-risk	1 year increase in diabetes duration	1.13	0.049	Each additional year of disease increases the risk of severe CAD by 13%
Low-risk vs. high-risk	Decreased LVEF	0.0004	0.019	Reduced cardiac function is a strong independent predictor of severe CAD
Low-risk vs. high-risk	Declining creatinine clearance	0.96	0.001	Declining renal function significantly increases the likelihood of complex CAD

*: Summary of the multinomial logistic regression analysis highlighting the independent predictors for high-risk coronary artery disease (SYNTAX score II ≥33) compared to the low-risk group, HbA1c: Glycated hemoglobin, LVEF: Left ventricular ejection fraction, CAD: Coronary artery disease

While limitations such as the single-center design and the exclusion of well-controlled diabetics restrict the generalizability of the findings, the conclusions offer valuable insights for clinicians. This study underscores the need for multicenter trials to refine personalized strategies for patients with diabetes, ultimately aiming to reduce the global burden of advanced CAD.

Ethics

Financial Disclosure: The author declared that this study received no financial support.

REFERENCES

1. World Health Organization. The top 10 causes of death [Internet]. 2024 [accessed 8 February 2025]. Available from: https://www.who.int/news-room/fact-sheets/detail/the-top-10-causes-of-death
2. Viruthagiri K, B AS, R P, T A V, D RJ. Study of coronary artery disease severity with HbA1c in patients with diabetes mellitus with SYNTAX score II - a prospective observational study. Int J Cardiovasc Acad. 11(4):154-60.
3. Selvin E, Marinopoulos S, Berkenblit G, Rami T, Brancati FL, Powe NR, *et al*. Meta-analysis: glycosylated hemoglobin and cardiovascular disease in diabetes mellitus. Ann Intern Med. 2004;141:421-31.