Evaluation of Metabolic Age in Assessment of Cardiovascular Risk in Newly Diagnosed Diabetes Patients in a Zimbabwean Hospital

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Abstract

Background: Cardiovascular diseases are the major contributors to morbidity and mortality globally, with more than three quarters of the cases occurring in low to middle income countries. Well established risk factors for cardiovascular disease include chronological age, diabetes, obesity, smoking and hypertension.

Objectives: To determine whether the Body Mass Index (BMI) affect the metabolic age and to ascertain whether the metabolic and chronological age are equally associated with cardiovascular risk.

Methods: Cross sectional study of newly diagnosed diabetes patients evaluated between October 2021 and mid June 2024. Demographic information, clinical examination and anthropometric measurements were obtained using a questionnaire. Metabolic age was captured from the participant's bioelectrical impedance body composition output data form. The qrisk3 score calculator (chronological age, ethnicity, gender, cholesterol/high density lipoprotein cholesterol, diabetes, hypertension, BMI and other chronic conditions) was used to calculate the cardiovascular risk using chronological and metabolic age. HbA1c, serum lipids, were measured.

Results: A total of 200 patients (148 women) were studied, 185 were analysed. Mean chronological age was 54.9±14 (95% CI, 52.8-56.9) years, metabolic age 57.5±14.6 (95% CI, 55.4-59.7) years, mean BMI 29.8±0.49 (95%CI 28.8-30.8). HbA1C 10.8 ± 3.39 % (95% CI, 10.39-11.4). Mean chronological risk score 9.8 ±0.62 (95% CI 8.6-11.0), mean metabolic age risk score 11.1±0.69 (95% CI 9.7-12.5). There was a positive correlation between BMI and metabolic age ($r = 0.6$, $p<0.0001$) and no correlation between chronological age and BMI ($r=0.01$, $p=0.8$). There was a significant difference in the association with cardiovascular disease risk between chronological age and metabolic age ($p<0.0001$) and metabolic risk score ($p<0.0001$), respectively.

Conclusion: Diabetes patients with a higher metabolic age at the time of diagnosis have a higher cardiovascular risk score than chronological age. Stringent lifestyle modifications needs to be included early in the management of patients with diabetes.

Key words: Metabolic age, Body Mass Index (BMI), Cardiovascular risk