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Comparison of the application of two cardiovascular prevention strategies in a swiss population-based cohort with 10 year follow-up

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Background: Cardiovascular (CV) prevention relies on strategies evaluating the 10-year CV risk to identify high-risk individuals who would benefit most from preventive interventions. In Switzerland, two risk scores are recommended: i) Prospective cardiovascular Mu’ñster score calibrated for Switzerland (SAI-AGLA); and ii) Systematic coronary risk estimation (SCORE). SAI-AGLA and SCORE predict different CV outcomes, SAI-AGLA predicting major coronary events (sudden cardiac deaths, and fatal or nonfatal myocardial infarctions) and SCORE predicting fatal CV events.

Purposes: Using a Swiss population-based cohort, we determined the predictive accuracy of two preventive strategies based on incident cardiovascular events over a 10-year period. The first aim was to assess prediction of major coronary events and fatal CV events for SAI-AGLA and SCORE, respectively. The second aim was to assess prediction of any CV event (i.e., all fatal and nonfatal cardiac and cerebrovascular events) for both scores.

Methods: Prospective cohort involving 6,733 subjects aged 35-75 years at baseline (54% women). Participants who refused follow-up or with missing data were excluded. Incident CV events were independently adjudicated. Very high-risk individuals were defined by presence of prior coronary disease, diabetes mellitus and/or chronic kidney disease. For the first aim, high-risk participants at 10 years were defined based on a major coronary event risk of >20% according to SAI-AGLA, and a fatal CV event risk of >5% according to SCORE. For the second aim, high-risk participants were defined based on 10-year risk of any CV event using the same risk thresholds. Discrimination, calibration and model fit of both scores were compared.

Results: 5,539 participants were analyzed, with a mean follow-up of 10.2 years. Overall, 422 incident CV events occurred, including, among others, 117 major coronary events, 34 fatal CV events and 158 strokes. Participants in the very high- and high-risk categories were 1,143 (21%) and 1,090 (20%) based on SAI-AGLA and SCORE, respectively. Among very high- and high-risk participants with a specific CV event, SAI-AGLA would have detected 53% of major coronary events, whereas SCORE would have detected 68% of fatal CV events. Concerning individuals in high-risk categories with any CV event, SAI-AGLA and SCORE would have detected 52% and 56% of fatal and nonfatal CV events, respectively. Discrimination of SAI-AGLA and SCORE for prediction of any CV event was similar (AUROC, 0.77 and 0.78, respectively; p=0.20), whereas SCORE presented a better calibration and model fit.

Conclusion: In this Swiss population-based cohort, prevention strategy of SCORE for very high- and high-risk individuals identified more subjects developing any CV event compared to SAI-AGLA, despite an equal number of individuals classified in high-risk categories.