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Evaluating Modifiable Hypertension Risk in Nigerian Adults — The Nigerian Diet Risk Score

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Cardiovascular diseases account for 31% of all global deaths, the majority (80%) of which are associated with hypertension.[1,2] As of 2019, hypertension is expected to affect 1 in 3 adults living in West Africa, with prevalence standing at 36.1% In Nigeria.[3,4] Poor dietary habits, including high intakes of salt, processed meat, ultra-processed foods, and unhealthy fats and oils and low intakes of vegetables, fruits, fibre, and nutrients such as potassium and omega-3 fatty acids, account for 9–17% of cases of hypertension globally, and our recent meta-analysis confirms their contribution in Nigeria and other West African countries.[1,5,6] This study aimed to develop and deliver a culturally-appropriate diet risk score for clinical practice that can (i) rapidly and accurately identify and stratify individuals at risk of hypertension and (ii) support clinicians and other healthcare professionals to provide tailored and effective personalised dietary advice.

We used a culturally-appropriate Nigerian Dietary Screening Tool (that we recently designed and validated[7,8]) to assess the dietary intake among 151 patients in a Nigerian hospital and used methods similar to Framingham and INTERHEART to: (i) construct and validate a Nigerian Dietary Risk Score (NiDRS) for hypertension, and (ii) evaluate the NiDRS against a panel of clinical biomarkers of hypertension, using multiple logistic regression models, internal validation using measures of discrimination and calibration, decision analysis curve and mediation analysis to facilitate its use in clinical practice.

Each incremental increase in the overall NiDRS was associated with a 2-fold increase in odds of overall hypertension (OR: 2.04, 95% CI: 1.16, 1.16, $p = 0.01$), with the highest score category associated with >18-food increased odds of hypertension, compared to lowest NiDRS (OR: 18.27, 95%CI: 1.33, 251.21, $p = 0.03$). The NiDRS demonstrated good discrimination with an AUC of 0.92%, high sensitivity (0.85), specificity (0.94), calibration (with a Brier score of 0.1) and a positive net benefit. In addition, via mediation analysis, total cholesterol (50%), triglycerides (47%), LDL-c (49%), VLDL-c (17%), CRP (68%), and homocysteine (71%) were mediators of the NiDRS-hypertension pathway in a positive direction.

The NiDRS is an accurate and valuable tool for clinicians to identify and stratify individuals at risk of hypertension and discuss dietary prevention strategies to address the rising prevention of hypertension and its associated cardiovascular complications in Nigeria.

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