Comparison of Plant-Based Diet Indices Scoring and Risk with Hypertension (OR33-06-19)

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Objectives: Recently, several distinct diet indices have been developed to characterize adherence to plant-based diets. We deconstructed and compared 6 plant-based diet indices (PDI) in a community-based cohort with respect to their scoring and their associations with incident hypertension.

Methods: Using food frequency questionnaire data from middle-aged adults ($n = 8041$) without hypertension in the Atherosclerosis Risk in Communities (ARIC) Study, we constructed overallPDI, healthyPDI, unhealthyPDI, provegetarian diet index, PDI from Rotterdam Study (PDI-Rotterdam), and comprehensive diet quality index (cDQI). For the overallPDI, provegetarian diet index, and PDI-Rotterdam, higher intakes of all or selected plant foods received higher scores. For the healthyPDI, higher intakes of plant foods identified as healthful received higher scores. For the unhealthyPDI, higher intakes of plant foods identified as unhealthful received higher scores. For the cDQI, higher intakes of healthful plant foods, dairy, and seafood received higher scores, but all other indices scored higher intakes of animal foods uniformly lower. We examined the magnitude of correlations and agreement between all pairs of indices, and assessed whether higher scores on these indices were associated with hypertension using Cox proportional hazard models, adjusting for socio-demographic factors, other dietary factors, and health behaviors.

Results: All indices had moderate to strong correlations ($r > 0.4$) and largely consistent rankings of subjects except for the PDI-Rotterdam and unhealthyPDI. Differences existed in how alcohol, potatoes, poultry, eggs, and dairy were scored. Greater adherence to overallPDI, healthyPDI, provegetarian diet, and cDQI was associated with a 9–26% lower risk of hypertension compared to lesser adherence (all P-trend < 0.05, Table). Greater adherence to the unhealthyPDI was associated with a 12% higher risk (P-trend $= 0.03$) when clinical factors were additionally adjusted; no association was observed with the PDI-Rotterdam.

Conclusions: Analyses revealed moderate agreement in ranking across subjects, suggesting that they are capturing similar dietary patterns. However, the way in which plant-based diets are operationalized can affect the ability to detect diet-disease associations.

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Supporting Tables, Images and/or Graphs:

Table. Adjusted Hazard Ratios and 95% Confidence Intervals for Incident Hypertension According to Quintiles of Plant-Based Diet Indices (PDI)

	Hazard Ratios and 95% Confidence Intervals[a]					
	Q1	Q2	Q3	Q4	Q5	*P*-trend
OverallPDI	1 [Ref]	0.98 (0.89, 1.06)	0.94 (0.87, 1.02)	0.91 (0.83, 0.99)	0.91 (0.83, 0.99)	0.02
HealthyPDI	1 [Ref]	0.95 (0.88, 1.03)	0.97 (0.88, 1.05)	0.97 (0.88, 1.06)	0.84 (0.77, 0.93)	0.004
UnhealthyPDI	1 [Ref]	1.00 (0.93, 1.10)	0.99 (0.91, 1.09)	1.01 (0.92, 1.09)	1.04 (0.96, 1.14)	0.41
Provegetarian Diet Index	1 [Ref]	0.96 (0.88, 1.05)	0.95 (0.87, 1.04)	0.93 (0.85, 1.00)	0.87 (0.79, 0.95)	0.002
PDI-Rotterdam[b]	1 [Ref]	1.02 (0.87, 1.18)	0.97 (0.84, 1.13)	1.01 (0.87, 1.18)	1.03 (0.88, 1.20)	0.74
cDQI	1 [Ref]	0.99 (0.90, 1.08)	0.86 (0.79, 0.94)	0.79 (0.72, 0.86)	0.74 (0.67, 0.81)	<0.001

PDI-Rotterdam, plant-based diet index from the Rotterdam Study; cDQI, comprehensive diet quality index

[a] Adjusted for socio-demographic factors (age, sex, race-center, education), other dietary factors (total energy intake, alcohol consumption, margarine consumption), and health behaviors (smoking status, physical activity)

[b] Did not adjust for alcohol intake and margarine intake because both were components of this index

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