THE EFFECT OF PLANT-BASED DIETS ON BLOOD PRESSURE: A SYSTEMATIC REVIEW AND META-ANALYSIS OF CONTROLLED CLINICAL TRIALS.

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Background: Strict vegetarian diets with no animal products are associated with low blood pressure (BP). It is not clear whether less strict plant-based diets (PBD) exert similar effects. We assessed whether less strict PBDs reduce BP in controlled clinical trials.

Methods: We carried out a systematic review and a meta-analysis of all published interventional trials assessing the effects of PBDs on BP according to PRISMA guidelines (PROSPERO: CRD42019153716). On 14 June 2019, we searched the following electronic databases limited to controlled trials published in the English language since the inception of each database: CINAHL, MEDLINE, Embase, and, Web of Science. For inclusion, studies had to fulfil the following criteria: (1) original published article; (2) age of participants ≥ 18 years; (3) plant-based diet as an intervention, defined as dietary patterns that support high consumption of fruits, vegetables, whole grains, legumes, nuts and seeds, and avoid the consumption of most or all animal products; (4) collection of sufficient data to allow calculation of mean differences in systolic/diastolic BP between individuals consuming a plant-based diet and those consuming a referent or control diet (5) Randomised controlled trial or controlled trial study design. Potential studies were independently screened in duplicate, and data were extracted. Standardised mean differences in BP and 95% C.I. were pooled using a random-effect model. Quality, sensitivity, heterogeneity and publication bias were assessed.

Results: 40 studies met the inclusion criteria. They included 8,203 participants (4,333 in intervention; 3,870 in control groups). The median sample size was n=65 (range 11-4,717) and mean age of the participants 50.5 yrs (range 25.6-71.0). All were controlled trials (duration 1.4-208 wks, median 12 wks). Of the 40 trials, 38 were randomised. Seven were crossover. Two were single-blinded. Two had controlled feeding and all were in free-living individuals. The interventions under investigation were the DASH diet (n=11), Mediterranean diet (MD, n=8), vegan diet (VD, n=8), lacto-ovo vegetarian diet (LOVD, n=5), healthy Nordic diet (ND, n=3), high fiber diet (HFD, n=3), and high fruit and vegetables diet (FVD, n=2). In the pooled analysis, PBDs were associated with lower systolic BP (DASH -5.53 mmHg [-7.95,-3.12], MD -0.95 mmHg [-1.70,-0.20], VD -1.61 mmHg [-4.53,1.31], LOVD -5.47 mmHg [-7.60,-3.34], ND -4.47 mmHg [-7.14,-1.81], HFD -0.65 mmHg [-1.83,053], FVD -0.57 mmHg [-7.45,6.32]. Similar effects were seen on diastolic BP. There was no evidence of publication bias and some heterogeneity was detected.

Conclusion: PBDs with limited or no animal products lower both systolic and diastolic BP, across sex, age, and body mass index.