

Diabetes

Lowering blood pressure may prevent the onset of diabetes

Antihypertensive therapy with ACE inhibitors (ACEI) and angiotensin II receptor blockers (ARB) lowers the risk of developing type 2 diabetes, a meta-analysis has shown.

Data from 22 studies carried out between 1973 and 2008, were obtained by the Blood Pressure Lowering Treatment Trialists' Collaboration in Oxford.

The authors included all primary and secondary prevention trials that used a specific class or classes of antihypertensive drugs versus placebo or other classes of blood pressure lowering drugs that had at least 1,000 person-years of follow-up in each randomly allocated arm.

The individual participant data meta-analysis included 145,939 (60.6% men) randomly assigned participants from 19 trials. Their mean age was 65 years.

After a median follow-up of 4.5 years, 9,883 participants were diagnosed with new onset type 2 diabetes.

A systolic blood pressure reduction of 5 mmHg reduced the risk of type 2 diabetes across all trials by 11%, hazard ratio (HR) 0.89 (95% CI: 0.84-0.95).

The authors further analysed this effect with respect to specific drug class for the five major classes of antihypertensive drugs. Data from 22 trials were used to calculate the relative risk (RR) for drug class comparisons.

Use of ACEI and ARB reduced the RR of new-onset type 2 diabetes compared with placebo.

- ACEI: RR 0.84 (95% CI: 0.76-0.93)
- ARB: RR 0.84 (95% CI: 0.76-0.92)

However, the use of beta blockers and thiazide diuretics appeared to

increase the risk compared with placebo.

- Beta blockers:
RR 1.48 (95% CI: 1.27-1.72)
- Thiazide diuretics:
RR 1.20 (95% CI: 1.07-1.35)

No effect was found for calcium channel blockers compared with placebo.

- Calcium channel blockers:
RR 1.02 (95% CI: 0.92-1.13)

The authors concluded that lowering blood pressure can prevent the onset of type 2 diabetes but the main classes of antihypertensive drugs have different effects with ACEI and ARB having the best outcomes. This could inform drug choices to treat hypertension according to the patient's overall risk of developing diabetes.

The study authors state: 'Using randomised evidence from major pharmacological blood pressure lowering trials, this study has shown consistent evidence to suggest that the preventive effect of blood pressure reduction on type 2 diabetes risk is causal, and therefore reducing blood pressure is likely to prevent new-onset type 2 diabetes.'

'This evidence also supports the indication for selected classes of antihypertensive drugs for the prevention of type 2 diabetes, which could further refine the selection of drug choice according to an individual's risk profile. In particular, ACEI and ARB should be considered as having the most favourable outcomes when clinical risk of diabetes is a concern.'

The authors of an accompanying comment¹ say: 'The absolute risk reduction found in this meta-analysis is modest; however, interventions with small benefits can have an outsized effect when applied to conditions as common as hypertension.'

'It remains unknown to what extent the reduction in diabetes risk is due to blood pressure reduction per se versus RAS (renin aldosterone system) inhibition specifically.'

'Despite its limitations, this meta-analysis provides additional evidence supporting the hypothesis that blood pressure control with specific medications can reduce the risk of diabetes. This study supports the possibility that earlier, more aggressive lowering of blood pressure, with an emphasis on RAS inhibitors, can decrease the incidence of diabetes,' they conclude.

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Nazarzadeh M, Bidel Z, Canoy D et al. Blood pressure lowering and risk of new-onset type 2 diabetes: an individual participant data meta-analysis. *Lancet* 2021;398:1803-10

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1 Cavender MA, Wirka RC. Blood pressure lowering in the prevention of type 2 diabetes. *Lancet* 2021;398: 1778-79

Respiratory disease

Novel model predicts risk factors for mortality in COPD

Heart failure and current smoking were the strongest risk factors for predicting ten-year mortality in COPD patients, a risk prediction model based on primary care data has found.

Data on 37,485 patients with COPD in the Clinical Practice Research Database were analysed. Patients were followed up for ten years. The main outcome was all-cause mortality.

Four types of predictors were examined, demographic and behavioural characteristics (e.g. exercise, smoking status, limitation of physical activity at diagnosis), comorbidities, and COPD severity. Because of the lack of spirometry data COPD severity was based on breathlessness, a history of COPD exacerbations and hospitalisation due to COPD.

The investigators developed and validated a machine learning-based prediction model of ten-year COPD mortality to help risk stratify patients.

Just over half the study population were male (53.1%), 86.2% were 56 years or older. Overall, 14.7% were never smokers, 63.3% former smokers and 22% current smokers. Mean age at COPD diagnosis was 68.

Approximately, a quarter (23.6%)