

Hypertension and Dementia Risk: A Systematic Review and Meta-Analysis

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INTRODUCTION

- Hypertension is a modifiable risk factor for dementia, yet evidence regarding the magnitude, timing and shape of this association remains inconsistent.
- Prospective large-scale cohort studies suggest that risk may vary by age at assessment and by how blood pressure (BP) and hypertension are measured and classified.
- The current systematic review incorporated recent longitudinal cohorts around the world with an updated synthesis to investigate the relationship between hypertension and dementia risk across the life course.

METHOD

STUDY DESIGN: Longitudinal cohort studies examining hypertension or high blood pressure in relation to incident all-cause dementia or Alzheimer's disease were included.

LITERATURE SEARCH:

- Database searched - PubMed, Scopus, Web of Science, PsycINFO, and WHO Global Index Medicus;
- Study selection: 1) hypertension; 2) dementia (or other types of dementia) as primary outcome; 3) English-language studies; and 4) Published from January 2020 through April 2026 were selected following PRISMA 2020 guidelines.

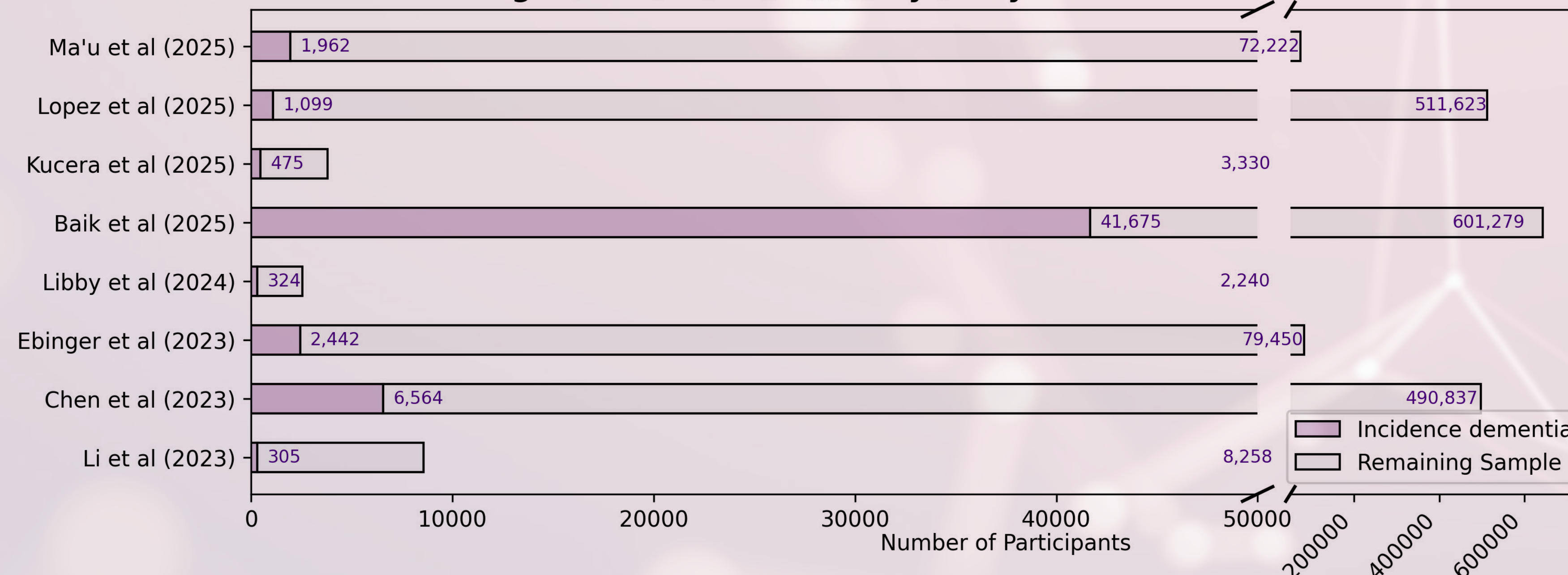
QUALITY ASSESSMENT: Study quality and risk of bias were independently assessed by two reviewers using the Newcastle–Ottawa Scale.

DATA SYNTHESIS: Quantitative synthesis used a random-effects model. Meta-analysis was used to analyse the association between hypertension with dementia and Hazard Ratios (HR) were pooled.

RESULT

The systematic review included recent large-scale population-based cohorts from the UK, North America, Asia, and Europe, encompassing over 4.5 million participants with follow-up ranging from 2 to over 22 years.

Figure 1 Dementia cases by study



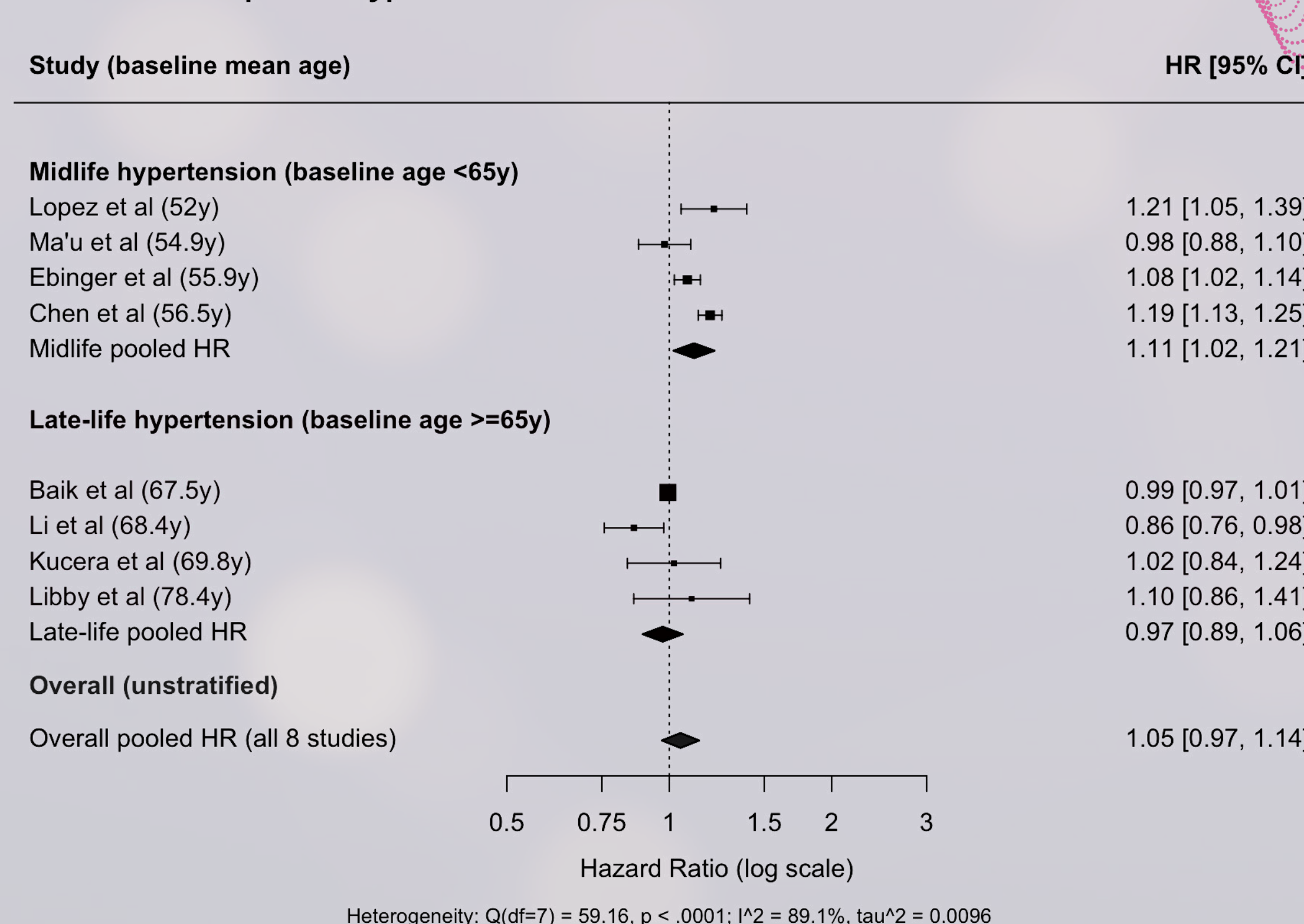
Across studies, an average of over 40% of participants had hypertension at baseline. Hypertension was associated with a modestly increased risk of incident dementia, although substantial heterogeneity was observed.

Pooled estimates from the random-effects meta-analysis used Restricted Maximum Likelihood (REML) estimation to derive the effect of hypertension on incident dementia. The preliminarily pooled estimate indicated an overall HR of 1.05, 95% CI [0.97–1.14], indicating no statistically significant association.

Example Baseline Study Characteristics

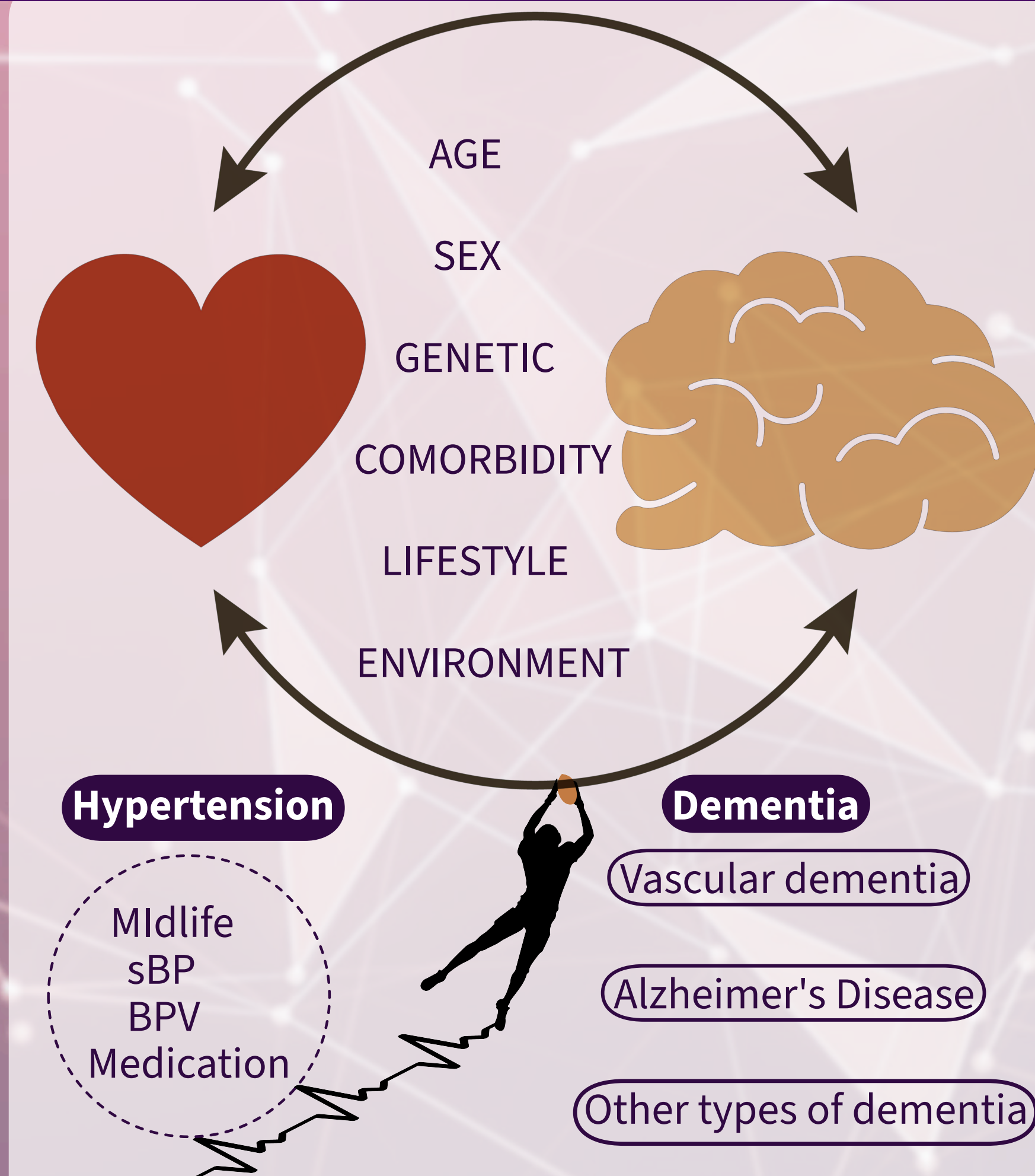
Study	Country	Baseline (n)	F(%)	HTN(%)	Age_M(SD)
Lopez et al	China	512722	59.0	34.5	52.0 (10.6)
Kucera et al	Czech Republic	3805	58.3	60.2	69.80 (5.40)
Baik et al	Korea	642954	35.4	26.8	67.5 (9.3)
Ma'u et al	New Zealand	74184	58.0	18.8	54.9 (15.6)
Libby et al	US	2564	45.6	68.9	78.4 (3.2)
Ebinger et al	US	81892	62.0	29.0	55.9 (18.8)
Li et al	US	8563	33.8	100.0	68.4(9.5)
Chen et al	UK	497401	54.4	27.0	56.5 (8.1)

Forest plot of Hypertension and Dementia Incidence: Midlife vs Late-Life



Individual studies reported divergent associations: midlife hypertension was significantly associated with elevated dementia risk (HR = 1.11, 95% CI [1.02, 1.21]), while attenuated or inverse associations were reported when assessed in later life. Variability in findings was partly attributable to age at BP/hypertension assessment, cohort characteristics and hypertension classification.

CONCLUSION



This updated synthesis highlights marked heterogeneity in the association between hypertension and dementia. Midlife hypertension appears consistently associated with increased dementia risk, whereas associations in later life are more variable and context dependent. Together, these findings support early detection of vascular risk and sustained BP management as key components of dementia prevention strategies. They also underscore the need for age-specific risk stratification in future epidemiological, trial and implementation studies, and highlight the importance of future work examining co-occurring psychological distress with vascular pathways in dementia risk.

REFERENCE

- Lindhout, J. E., et al (2025). Association between hypertension and dementia risk in low- and middle-income countries: A systematic review.
Livingston, G., et al (2024). Dementia prevention, intervention, and care: 2024 report of the Lancet standing Commission.
Lennon, M. J., Koncz, R., & Sachdev, P. S. (2021). Hypertension and Alzheimer's disease: Is the picture any clearer?

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