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Antihypertensive Medication and Fracture Risk in Older Veterans Health Administration Nursing Home Residents

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Key Points

Question Is initiating antihypertensive medication associated with increased fracture risk among older long-term Veterans Health Administration nursing home residents?

Findings In a 1:4 propensity score–matched cohort of 64710 residents, initiation of antihypertensive medication was associated with increased fracture risk and adjusted excess risk per 100 person-years. This risk was numerically higher in subgroups of residents with dementia or with systolic blood pressure of 140 mm Hg or higher or diastolic blood pressure of 80 mm Hg or higher.

Meaning Findings from this cohort study suggest that caution and additional monitoring are advised when initiating antihypertensive medication in this vulnerable population.

Abstract

Importance Limited evidence exists on the association between initiation of antihypertensive medication and risk of fractures in older long-term nursing home residents.

Objective To assess the association between antihypertensive medication initiation and risk of fracture.

Design, Setting, and Participants This was a retrospective cohort study using target trial emulation for data derived from 29 648 older long-term care nursing home residents in the Veterans Health Administration (VA) from January 1, 2006, to October 31, 2019. Data were analyzed from December 1, 2021, to November 11, 2023.

Exposure Episodes of antihypertensive medication initiation were identified, and eligible initiation episodes were matched with comparable controls who did not initiate therapy.

Main Outcome and Measures The primary outcome was nontraumatic fracture of the humerus, hip, pelvis, radius, or ulna within 30 days of antihypertensive medication initiation. Results were computed among subgroups of residents with dementia, across systolic and diastolic blood pressure thresholds of 140 and 80 mm Hg, respectively, and with use of prior antihypertensive therapies. Analyses were adjusted for more than 50 baseline covariates using 1:4 propensity score matching.

Results Data from 29 648 individuals were included in this study (mean [SD] age, 78.0 [8.4] years; 28 952 [97.7%] male). In the propensity score-matched cohort of 64 710 residents (mean [SD] age, 77.9 [8.5] years), the incidence rate of fractures per 100 person-years in residents initiating antihypertensive medication was 5.4 compared with 2.2 in the control arm. This finding corresponded to an adjusted hazard ratio (HR) of 2.42 (95% CI, 1.43-4.08) and an adjusted excess risk per 100 person-years of 3.12 (95% CI, 0.95-6.78). Antihypertensive medication initiation was also associated with higher risk of severe falls requiring hospitalizations or emergency department visits (HR, 1.80 [95% CI, 1.53-2.13]) and syncope (HR, 1.69 [95% CI, 1.30-2.19]). The magnitude of fracture risk was numerically higher among subgroups of residents with dementia (HR, 3.28 [95% CI, 1.76-6.10]), systolic blood pressure of 140 mm Hg or higher (HR, 3.12 [95% CI, 1.71-5.69]), diastolic blood pressure of 80 mm Hg or higher (HR, 4.41 [95% CI, 1.67-11.68]), and no recent antihypertensive medication use (HR, 4.77 [95% CI, 1.49-15.32]).

Conclusions and Relevance Findings indicated that initiation of antihypertensive medication was associated with elevated risks of fractures and falls. These risks were numerically higher among residents with dementia, higher baseline blood pressures values, and no recent antihypertensive medication use. Caution and additional monitoring are advised when initiating antihypertensive medication in this vulnerable population.

Invited Commentary

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April 23, 2024

Very Plausible Results

David Karpf, ND | Stanford University School of Medicine

I read with interest the report "Antihypertensive Medication and Fracture in in Older Veterans Health Administration Nursing Home Residents".

For a non-RCT, the methodology utilized by the authors provides pretty compelling and entirely plausible results, that adding a BP med or initiating a BP med in an older population of nursing home residents increases the risk of falls, and hence fractures (as well as probably brain trauma and mortality, via the probably mechanism of orthostatic hypotension.

While I follow a large population of patients with osteoporosis (but almost completely lacking dementia or benzodiazepine use or other risk factors), ...

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Measurement errors contributing to overtreatment

Steven Yarows, MD | IHA Trinity

I want to thank the authors for this very important research concluding the dangerous of anti-hypertension overtreatment in this frail population. I postulate that mismeasurement of the blood pressure contributed to the overtreatment with medication. This has been reported for the hospitalized population resulting in increased ICU admissions and acute kidney failure. Most nursing home measurements are not performed with the patient sitting in a chair for 5 minutes prior to measurements. Supine blood pressures and measurements without a proper rest period result in artificial elevated readings which can lead to overtreatment and injury. ...

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Over treatment - causes harm

Arun Tandon |

Antihypertensive use to bring BP to 120/80, in Elderly is a sure way to increase fall risk. Keep BP a little higher so the elderly have enough strength to get up and go.

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