# Therapeutic Role of Aliskiren Monotherapy in Chronic Kidney Disease: A Systematic Review and Meta-analysis of Antihypertensive and Antiproteinuric Effects

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## Background

- Hypertension and chronic kidney disease (CKD) have a bidirectional relationship and increase cardiovascular and renal risk. (1)
- The renin–angiotensin system (RAS) is a key treatment target, though ACEIs and ARBs may cause intolerance. (2)
- Aliskiren, a direct renin inhibitor, blocks the RAS at its initial step and reduces plasma renin activity. (3)
- Evidence on its efficacy and safety in CKD populations remains limited, especially for long-term outcomes.

## Objective

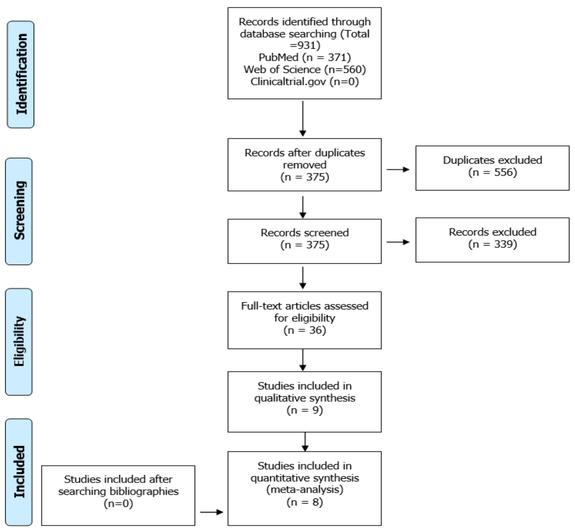
- To evaluate the efficacy and safety of aliskiren monotherapy on blood pressure and urinary protein excretion in patients with chronic kidney disease through systematic review and meta-analysis.

## Methods

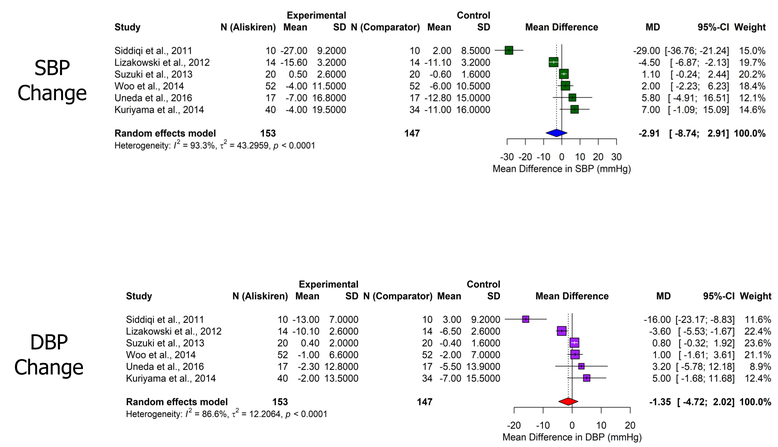
**Design:** Systematic review and meta-analysis- conducted following PRISMA 2020 guidelines.
**Data Sources:** PubMed and Web of Science; searched from January 2001 to February 2026.
**Eligibility Criteria:** Clinical trials in adults (≥18 years) with CKD evaluating aliskiren monotherapy versus placebo or antihypertensive comparators.
**Outcomes:** Changes in systolic blood pressure (SBP), diastolic blood pressure (DBP), and urinary protein excretion.
**Statistical Analysis:** Random-effects meta-analysis using mean differences (MD) for blood pressure outcomes and log response ratios for urinary protein excretion.
**Risk of Bias Assessment:** RoB 2 for RCT and ROBINS-I for non-randomized studies.

# R E S U L T S

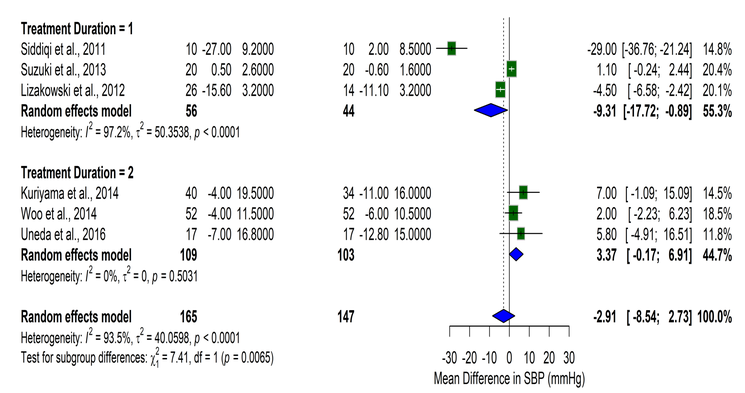
### Figure 1: Flow Diagram of the Literature Search and Study Selection Process




### Figure 2: Effect of Aliskiren in SBP/DBP Reduction Compared with Placebo/ Comparator.




### Figure 3: SBP Reduction by Treatment Duration (<24 vs ≥24 Weeks)




## Results

**Studies Included:** 8 trials (n=300 for BP; n=209 for urinary protein Excretion). (Figure 1)

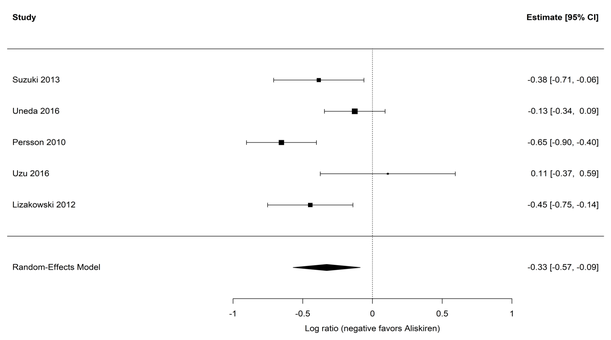
**Blood Pressure:**

- No significant overall reduction in SBP (−2.91 mmHg) or DBP (−1.35 mmHg). (Figure 2)
- Short-term Effect (<24 weeks): Significant SBP reduction (−9.31 mmHg; P<0.05), not sustained long-term. (Figure 3)

**Urinary Protein Excretion:**

- Aliskiren significantly reduced proteinuria by ~28% (LRR = −0.33; p = 0.007), indicating meaningful improvement in renal biomarkers. (Figure 4)

### Figure 4: Forest Plot for the Effect of Aliskiren on Urinary Protein Excretion




## Conclusion

- Aliskiren monotherapy provides modest and short-term reductions in blood pressure but demonstrates a significant antiproteinuric effect (~28%) in patients with CKD, suggesting potential renoprotective benefits independent of blood pressure control.

**References**

1. Agarwal R, Nissenson AR, Batlle D, Coyne DW, Trout JR, Warnock DG. Prevalence, treatment, and control of hypertension in chronic hemodialysis patients in the United States. The American Journal of Medicine. 2003;115(4):291–297.
2. Musini VM, Lawrence KA, Fortin PM, Bassett K, Wright JM. Blood pressure lowering efficacy of renin inhibitors for primary hypertension. Cochrane Database of Systematic Reviews. 2017;(4).
3. Zhao Q, Shen J, Lu J, Jiang Q, Wang Y. Clinical efficacy, safety and tolerability of aliskiren monotherapy. BMC Cardiovascular Disorders. 2020;20(1):179.

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