

Comparative Effectiveness of Riociguat versus Treprostinil in Chronic Thromboembolic Pulmonary Hypertension: A Propensity-Matched Analysis Using the TriNetX Research Network

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Background

Chronic thromboembolic pulmonary hypertension (CTEPH) is a progressive form of pulmonary hypertension with significant morbidity and mortality. Both riociguat and treprostinil are approved treatments, but comparative effectiveness data remain limited.

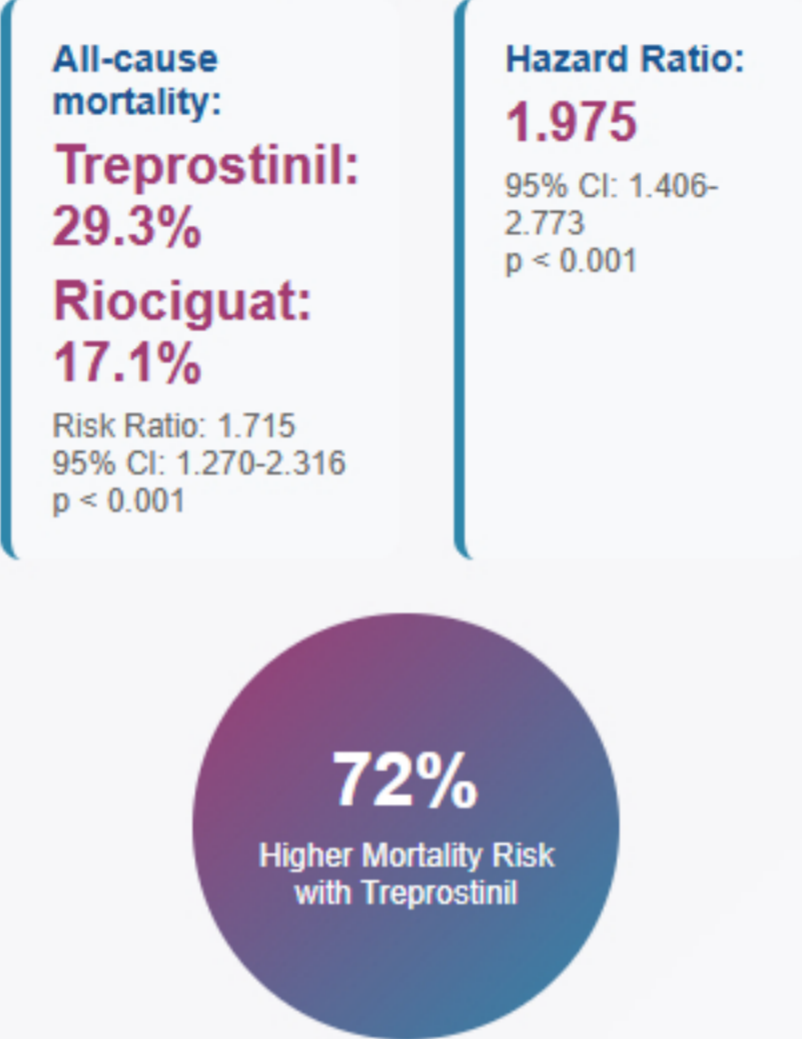
Objective

To compare the effectiveness and safety of riociguat versus treprostinil in patients with chronic thromboembolic pulmonary hypertension (CTEPH).

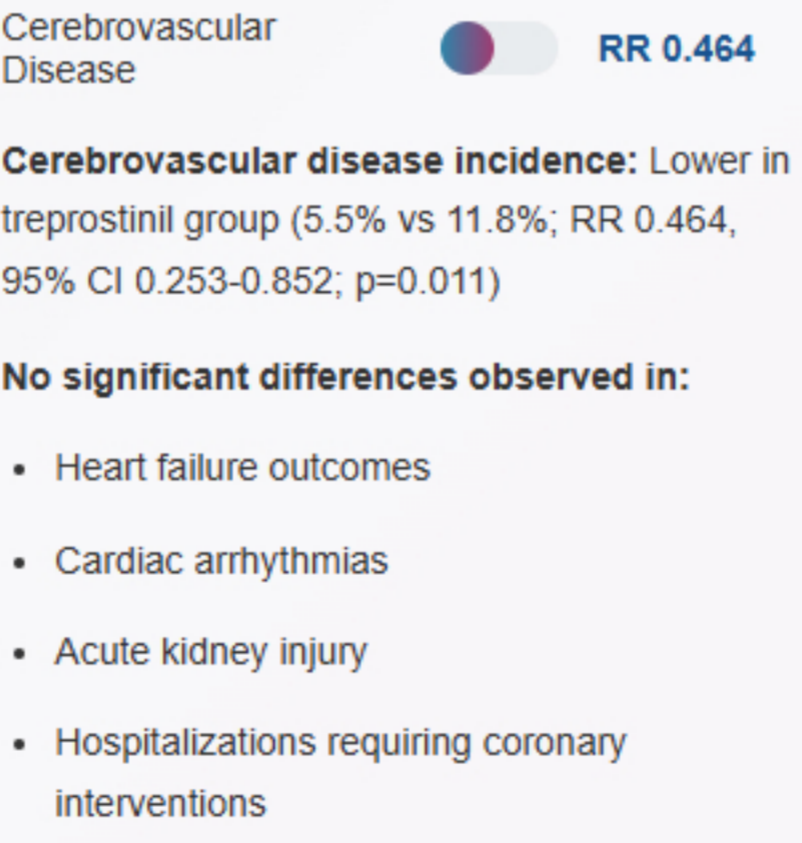
Methods

- Design:** Retrospective cohort study using TriNetX Global Collaborative Network (129 healthcare organizations)
- Population:** Patients diagnosed with CTEPH (ICD-10 code I27.24)
- Treatment groups:** Treprostinil (n=314) vs Riociguat (n=2,371)
- Analysis:** Propensity score matching for demographics and clinical characteristics
- Final cohorts:** 310 patients in each matched group
- Primary outcome:** All-cause mortality
- Secondary outcomes:** Cardiovascular events, arrhythmias, hospitalizations
- Follow-up:** Five-year period

Primary Outcome



Secondary Outcomes



Results Summary

In this large propensity-matched analysis of CTEPH patients, riociguat treatment was associated with significantly lower all-cause mortality compared to treprostinil.

Key findings:

- 72% higher mortality risk with treprostinil vs riociguat
- Reduced cerebrovascular disease risk with treprostinil
- No significant differences in other cardiovascular outcomes

Conclusion

Riociguat treatment was associated with significantly lower all-cause mortality compared to treprostinil in CTEPH patients. The differential impact on cerebrovascular outcomes suggests complex mechanisms of action that warrant further investigation.

Clinical Implications: These findings provide real-world evidence to inform treatment selection in CTEPH management, suggesting potential survival advantages of riociguat over treprostinil in this high-risk population.

Strengths and Limitations

Strengths:

- Large sample size
- Propensity matching
- Real-world evidence
- Multi-center data
- Five-year follow-up

Limitations:

- Retrospective design
- Potential residual confounding
- Medication adherence unknown
- Disease severity not captured