# Effectiveness of intravenous thrombolysis in patients with lacunar ischemic stroke in a real-world setting

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## Background

Lacunar stroke (LS) accounts for approximately 25% of ischemic strokes. The efficacy of intravenous thrombolysis (IVT) in this subgroup has been less extensively studied compared to other stroke subtypes.

The WAKE-UP trial subgroup analysis (Barow et al., 2019) suggested a trend toward better outcomes with IVT in LS patients, although statistical significance was not reached due to the limited sample size. Real-world data are needed to better assess clinical benefit in this population.

**Methods:** A set of patients with ischemic stroke were included from the prospective population-based registry of the district of L'Aquila, Italy. Patients were identified from medical records, emergency medical services, general practitioners, and death certificates. For this analysis, patients with LS occurring between 2018 and 2022 were included. We computed the odds ratio (OR) of achieving a modified Rankin Scale (mRS) score of 0–2 at hospital discharge in IVT-treated patients compared with non-treated patients. The OR was adjusted for age, sex, pre-stroke mRS score, onset-to-door time, and vascular risk factors.

**Discussion:** The effectiveness of IVT in LS patients remains debated due to the relatively mild disability, which makes the risk-benefit evaluation less clear compared with other ischemic stroke subtypes. Our findings differ from the Austrian Stroke Unit Registry (Eggers et al., 2017), which reported significant short-term NIHSS improvements and better 3-month mRS outcomes in IVT-treated LS patients compared with untreated patients. The WAKE-UP trial subgroup analysis (Barow et al., 2019) indicated a consistent pattern of better outcomes with IVT than with placebo in LS, though not statistically significant due to small sample size. Importantly, our real-world data are affected by patient selection, which may have contributed to similar outcomes between treated and untreated patients.

**Objectives:** This study evaluates the effectiveness of intravenous thrombolysis (IVT) in patients with lacunar stroke (LS) compared with untreated patients in a real-world setting.

**Results:** Of 969 ischemic stroke patients included during the study period, 177 (18.3%) had LS, of whom 81 (45.8%) received IVT. At discharge, 72 IVT-treated patients (88.9%) and 75 untreated patients (81.5%) achieved an mRS score of 0–2. Patients receiving IVT did not differ significantly from those not treated, except for onset-to-door time (<4.5 hours for all IVT-treated patients, while 12 untreated patients arrived >4.5 hours after onset; $p<0.001$). The adjusted OR for mRS 0–2 at discharge was 1.44 (95% CI 0.03–76.31) for IVT versus no treatment.

**Conclusions:** Our findings suggest that large sample sizes are needed to demonstrate the effectiveness of IVT for LS, as these patients generally have excellent functional outcomes. Nonetheless, IVT was not associated with adverse effects in appropriately selected patients, suggesting that, when administered early and safely, it may still represent a reasonable therapeutic option.