

Xanthine Oxidase Inhibition as a Neurovascular Therapeutic Target After Stroke: A Systematic Review

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Systematic Review

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Abstract

Background

Hyperuricaemia is a potentially modifiable risk factor for cardiovascular disease. Xanthine oxidase inhibition via allopurinol may reduce oxidative stress and improve vascular function, however its role in cerebrovascular disease is unclear. Given the overlap in pathophysiology, allopurinol may mitigate secondary injury following stroke.

Methods

A systematic review was conducted in accordance with PRISMA guidelines and prospectively registered with PROSPERO. We searched PubMed, Scopus, and CENTRAL from inception to 1st January 2026 for studies evaluating uric acid-lowering therapies in adult stroke populations. Eligible studies evaluated clinical, biochemical, vascular, or neuroimaging outcomes. Meta-analysis was not performed due to heterogeneity. Risk of bias and certainty were assessed using study-specific validated tools.

Results

Six eligible trials, all evaluating allopurinol in predominantly ischaemic stroke populations, were included. Allopurinol dose (100–600 mg/day), treatment duration (6–104 weeks), and timing (< 24 hours to several years post-stroke) varied substantially. No consistent benefit was observed for neurological impairment, recurrence, or mortality. Early treatment was associated with dose-dependent reductions in endothelial activation, while other studies demonstrated improvements in vascular measures potentially independent of urate reduction. Subacute and chronic trials found no effect on cerebrovascular reactivity or white matter hyperintensity progression.

Conclusions

Xanthine oxidase inhibition with allopurinol demonstrates heterogeneous biological and vascular effects following stroke, without consistent clinical benefit. Any therapeutic signal appears concentrated in studies evaluating earlier treatment initiation, without definitive conclusions regarding optimal timing or dose. Current evidence does not support routine allopurinol use following stroke but may indicate a plausible early therapeutic window for further investigation.

Background

Hyperuricaemia has emerged as a potentially modifiable risk factor for cardiovascular disease. Recent studies demonstrate associations between elevated serum uric acid and endothelial dysfunction, oxidative stress, and systemic inflammation^{1–4}. Furthermore, inhibition of uric acid synthesis via agents, such as allopurinol and febuxostat, appears to reduce cardiovascular events and mortality in patients with coronary artery disease (CAD), as well as improve endothelial function^{5–7}.

Despite evidence of benefit in CAD, the role of uric acid-lowering therapies in cerebrovascular disease remains under-investigated. Given that both ischaemic and haemorrhagic stroke share several pathophysiological mechanisms with atherosclerotic cardiovascular disease⁸, it is plausible that similar effects may be seen in the cerebrovascular population. Xanthine oxidase inhibition via allopurinol reduces reactive oxygen species (ROS), thus attenuating oxidative stress, improving endothelial function, and potentially limiting secondary neuronal injury⁹. This pathway offers a

biologically plausible mechanism by which xanthine oxidase inhibition could confer neurovascular protection beyond simple urate reduction

Preclinical and mechanistic studies support a possible role of xanthine oxidase inhibition in stroke management^{10–12}, due to its anti-inflammatory properties. Pre-clinical animal studies suggest that hyperuricaemia may exacerbate infarct progression, impair cerebral perfusion, and amplify post-stroke inflammatory processes. These observations support targeting uric acid metabolism early to mitigate oxidative and endothelial injury and improve recovery.

Within the existing literature, emphasis has focused on mechanistic insights or the prognostic value of serum uric acid¹³, or produced meta-analyses that primarily pool efficacy estimates by treating xanthine oxidase inhibition as a uniform intervention across heterogeneous trial designs¹⁴. Such approaches provide limited insight into how differences in timing, dose, comparator choice, patient selection, and outcome measures may account for inconsistent findings. In contrast, this article reframes uric acid not merely as a prognostic biomarker but as a modifiable, biologically contingent therapeutic target. Thus, we adopt a mechanistically informed synthesis framework, prioritising intervention timing, dose, and outcome alignment over pooled effect estimation, to identify translational gaps and guide rational trial design.

Methods

Study Protocol

The review was conducted according to the Preferred Reporting Items for Systematic Reviews and Meta-analyses (PRISMA) guidelines¹⁵ and prospectively registered with the PROSPERO international systematic review registry¹⁶. The study protocol can be accessed online at: <https://www.crd.york.ac.uk/PROSPERO/view/CRD420251276483>. One important deviation from the preregistered protocol was the decision not to perform a meta-analysis due to the significant degree of inter-study heterogeneity in terms of timing, dose, and measured endpoints.

Information Sources

The search of the literature included three databases: PubMed, Cochrane Central Register of Controlled Trials (CENTRAL), and Scopus. The initial search was performed on January 2, 2026, and included studies published from database inception to January 1, 2026.

Literature Search Strategy

A full search strategy for each database can be found within the Supplementary Materials section as **Supplementary Item(s) S1, S2, and S3**. To capture the most recent publications, the search combined controlled vocabulary (MeSH) and free-text terms, linked within each PICO (population, intervention, control/comparison, outcome) category using the Boolean operator “OR.” The distinct PICO categories were then combined using the Boolean operator “AND.” Additional articles were identified for inclusion by screening the reference lists of relevant studies.

Eligibility Criteria

Included records comprised both randomised and non-randomised controlled trials, as well as observational studies (cohort studies, case-control studies, and case series), published in a peer-reviewed academic journal from inception to January 1, 2026. These studies involved humans with or without hyperuricaemia or gout who experienced stroke (including both ischaemic and haemorrhagic stroke). Records were eligible if participants were treated through

interventions aiming to reduce serum uric acid, including allopurinol or febuxostat. Studies that assessed clinical, biochemical, or neuroimaging outcomes, including (but not limited to) infarct volume, neurological function, mortality, or stroke recurrence, were included.

Excluded records included reviews of any type (including, but not limited to, narrative reviews, systematic reviews, scoping reviews, or umbrella reviews), as well as meta-analyses, isolated case reports, conference abstracts, letters, practice guidelines, book chapters, and unpublished (e.g., preprint) studies. Studies were also excluded if they did not investigate stroke, involved participants with chronic hyperuricaemia or gout without a history of stroke, or did not apply uric acid-targeted interventions. Studies examining haemorrhagic transformation secondary to an acute ischaemic stroke were included. Only articles published in English were considered. Studies that utilised preclinical models and in vivo animal studies were excluded.

Article Selection and Extraction

Records were imported to the EndNote™ 20 reference management software (version 20.6). This enabled the automated removal of duplicate articles. Two review authors (DJ and DN) conducted a preliminary title and abstract screen according to the predefined eligibility criteria described above. The remaining studies were assessed via a full-text screening, which was performed independently in an unblinded standardised manner by the same two authors. Conflicts were settled by consensus between the reviewers. During this process, it was noted that three of the included articles shared a set of authors. The corresponding author of each article was therefore contacted to confirm that independent cohorts were utilised and prevent study duplication.

Data Items

When available, the following data items were extracted and recorded within a Microsoft Excel document: surname of first author, year of publication, country of publication, study design, stroke subtype (ischaemic versus haemorrhagic), number of subjects in intervention and control groups, sex of participants, intervention (i.e., the specific xanthine oxidase inhibitor), dose and route of administration, timing of administration from stroke onset, mechanism of action of the intervention, infarct volume, neurological outcomes/deficits, stroke recurrence or risk, and adverse events. Data extraction was performed in duplicate by DJ and DN.

Data Synthesis and Statistical Analysis

Due to limited studies and substantial heterogeneity, formal quantitative synthesis was not performed. Included studies varied widely with respect to stroke subtype and timing of intervention relative to the index event, allopurinol dosing regimens and treatment duration, baseline uric acid status, and the selection of outcome measures, which ranged from biochemical and endothelial markers to imaging-based surrogates and clinical functional endpoints. This heterogeneity precluded meaningful pooling of effect estimates or meta-analytic comparison. Instead, findings were synthesised narratively, with emphasis placed on mechanistic outcomes, timing of intervention, and consistency of biological signals across studies, rather than on aggregate effect sizes.

Risk of Bias and Certainty of Evidence

The risk of bias within included studies was assessed independently by two reviewers (DJ and DN) using validated tools appropriate to study design. The Cochrane Risk of Bias 2.0 tool was used for randomised controlled trials. Use of the Newcastle-Ottawa Scale (NOS) was intended for observational studies, however no such articles met eligibility criteria.

Domains influencing the likelihood of bias included randomisation process, deviations from intended interventions, missing outcome data, outcome measurement, and selection of reported result. Discrepancies were resolved by consensus between two reviewers. Risk of bias assessments informed the interpretation of findings and sensitivity considerations.

Certainty of evidence for each outcome was evaluated using the Grading of Recommendations Assessment, Development and Evaluation (GRADE) framework. Evidence from randomised studies was initially rated as high certainty (no non-randomised studies were eligible for inclusion) and subject to downgrading based on factors including risk of bias, inconsistency, indirectness, and imprecision. GRADE assessments were used to guide interpretation of the findings but did not influence study inclusion. A tabulated summary of the GRADE assessment can be found in the Supplementary Materials section.

Ethical Declaration

This review does not contain studies performed by any of the authors. As this study only uses data from previously published reports, ethics approval was not required.

Results

Study Selection

A search of PubMed, Scopus, and Cochrane CENTRAL was conducted on 2nd January 2026, producing a total of 572 entries (PubMed = 81, Scopus = 361, CENTRAL = 130). This was reduced to 495 after the automated removal of duplicate entries. 479 studies were then rejected in the preliminary screening of article titles and abstracts, resulting in 16 articles remaining. Of these, ten were rejected due to having an inaccessible full text (n = 1), incorrect intervention (n = 4), incorrect outcome (n = 3), or for utilising an identical cohort to another article (n = 2). A complete list of all studies excluded during full-text screening, with an associated reason for exclusion, can be found in the Supplementary Materials section as **Supplementary Item S4**. Overall, only six trials met inclusion criteria, reflecting the currently limited evidence base. The article selection process is illustrated in **Fig. 1**.

INSERT FIGURE 1 HERE

Study Characteristics

Six studies^{17–22} met the review inclusion criteria, of which all were randomised controlled trials evaluating the effects of xanthine oxidase inhibition in stroke populations. No observational studies met inclusion criteria after screening, most likely because xanthine oxidase inhibition is not a component of standard post-stroke care. All six studies utilised allopurinol as their xanthine oxidase inhibitor. Sample sizes ranged from 28 to 372 patients, with the mean patient age ranging from 58 to 71 years. There was a high degree of heterogeneity in medication dosage (ranging from 100 to 600 mg/day), duration (6 weeks to 104 weeks), and timing relative to stroke onset (ranging from initiation within 24–72 hours post-stroke to several years post-event in chronic stroke survivors).

Across the included trials, ischaemic stroke predominated. Three studies^{17, 21, 22} exclusively enrolled patients with ischaemic stroke, including cohorts recruited within 24–72 hours of symptom onset as well as subacute subcortical ischaemic stroke survivors. Two studies^{18, 19} enrolled patients with both ischaemic stroke and transient ischaemic attack. One study²⁰ enrolled a mixed cerebrovascular population comprising patients with ischaemic stroke or TIA and two patients with intracerebral haemorrhage. No included trial specifically targeted intracerebral or subarachnoid

haemorrhage. Overall, trials were small, heterogeneous, and focused almost exclusively on ischaemic stroke. **Table 1** summarises the six trials included in this review.

INSERT TABLE 1 HERE

Clinical Outcomes

Functional Outcomes

Functional recovery outcomes were highly heterogeneous, reflecting variation in intervention timing. Taheraghdam et al.²² conducted the only trial initiating allopurinol within 24 hours of stroke onset, and reported a significantly higher proportion of patients achieving favourable functional outcomes (defined as a modified Rankin Scale of 0–2) at three months, compared with the placebo group. In this study, allopurinol use was independently associated with improved functional status after adjustment for confounders. However, the study possessed a limited sample size, was not prospectively registered, and reported a large treatment effect in the context of a small sample size, which warrants cautious interpretation. Thus, functional benefit was observed only in a single small early-phase trial with potential bias.

Neurological Impairment

Neurological impairment was not systematically or uniformly assessed across the included trials. One acute-phase trial reported on neurological recovery as measured by the National Institutes of Health Stroke Scale (NIHSS)²¹. In this study, no significant difference in neurological recovery was observed between treatment groups, despite observing dose-dependent reductions in intercellular adhesion molecule-1 (ICAM-1) levels when high-dose allopurinol was initiated within 72 hours of stroke onset. As such, early biological effects did not translate into measurable neurological improvement.

Stroke Recurrence

Two trials reported stroke recurrence over follow-up periods of 104 and 52 weeks, and found similar event rates in both the intervention and placebo groups^{18, 19}. Neither trial demonstrated a significant reduction in stroke recurrence with allopurinol.

Mortality

No included study reported a significant all-cause, cardiovascular, or cerebrovascular mortality benefit following administration of allopurinol therapy. Mortality rates were concordantly low across the two trials^{18, 22} that reported this outcome. However, follow-up durations varied substantially across the studies, limiting the ability to detect differences in survival outcomes.

Safety and Adverse Events

Across studies reporting safety outcomes^{17, 18, 21, 22} allopurinol was well tolerated, with adverse event rates comparable to placebo, including in acute, subacute, and long-term post-stroke settings. The remaining studies^{19, 20} did not systematically report adverse events. Therefore, no clear safety signal was identified within the limitations of available reporting.

Biological and Mechanistic Outcomes

Serum Uric Acid Levels

Reductions in serum uric acid levels were observed consistently in all studies^{17–22}. However, changes in biochemical inflammatory markers did not uniformly correlate with urate lowering, implying at least in part a urate-independent

mechanism. Thus, urate reduction was consistent but did not predict clinical or mechanistic benefit.

Cerebrovascular Physiology

The mechanistic effects of allopurinol were most evident in the acute phase of stroke. Muir et al.²¹ demonstrated that six weeks of high-dose allopurinol (300 mg QD), initiated within 72 hours of stroke onset, produced a dose-dependent reduction in circulating intercellular adhesion molecule-1 (ICAM-1), consistent with attenuation of endothelial activation and post-ischaemic inflammation. However, no corresponding reductions were observed in other inflammatory biomarkers, including C-reactive protein and interleukin-6.

Evidence for favourable vascular effects was more consistent. Higgins et al.¹⁹ reported reductions in central systolic blood pressure (-6.6 mmHg), augmentation index (-4.4%), and slower progression of carotid intima-media thickness (-0.097 mm) following 12 months of allopurinol therapy. Similarly, Khan et al.²⁰ demonstrated significant improvements in vascular stiffness and augmentation index (7.00% reduction versus 5.28% increase) over eight weeks in hyperuricaemic stroke survivors. The absence of a dose-response relationship in this study suggests these vascular benefits may reflect reduced oxidative stress rather than urate lowering itself.

Despite these mechanistic signals, larger multicentre trials failed to demonstrate improvements in cerebrovascular surrogate outcomes. Dawson et al.¹⁷ observed no effect of allopurinol on cerebrovascular reactivity after three months of treatment initiated between two weeks and six months following stroke. Likewise, a subsequent multicentre trial by the same group found no reduction in white matter hyperintensity progression over 104 weeks, as assessed by volumetric FLAIR MRI and the Rotterdam Progression Score¹⁸.

Quality of Evidence

Assessment of Risk of Bias

Risk-of-bias assessments varied substantially between trials. Several studies were deemed to have concerns relating to incomplete reporting of allocation procedures, missing outcome data, and selection of reported results. Most trials were randomised, double-blind, and placebo-controlled, which reduced concerns regarding deviations from intended interventions and outcome measurement. Full study-level RoB 2 assessments can be found in the Supplementary Materials.

Assessment of Certainty of Evidence

Assessment of certainty of evidence using the GRADE framework showed overall low and variable certainty across outcomes. Functional outcomes were rated as low certainty, with only one single small early-phase trial suggesting benefit when allopurinol was initiated within 24 hours of ischaemic stroke. Confidence was limited by the small sample size, potential risk of bias, and imprecision. Neurological impairment (NIHSS) was graded as low certainty due to limited and inconsistent evidence, small sample sizes, single-centre studies, and incomplete reporting of baseline severity. Evidence for recurrent cerebrovascular events and mortality was also low certainty, constrained by low event rates, small sample sizes, short or heterogeneous follow-up, and limited power. In contrast, serum uric acid reduction showed high-certainty evidence, with consistent biochemical effects across trials. Safety and tolerability were rated as moderate certainty, although incomplete adverse event reporting reduced confidence. Vascular and endothelial outcomes were rated as moderate certainty, reflecting favourable effects on selected measures of vascular and endothelial function, but inconsistency across physiological outcomes and substantial heterogeneity in endpoints, treatment timing, and duration of follow-up. Overall, clinical evidence remained low certainty despite robust biochemical effects. Full GRADE assessments are provided in the Supplementary Materials section.

Discussion

This systematic review provides a mechanistically focused synthesis of the literature examining xanthine oxidase inhibition in stroke populations, demonstrating that the biological effects of allopurinol may vary according to intervention timing, dose, and outcome selection. While trials conducted in predominantly subacute stroke cohorts failed to demonstrate meaningful benefits on imaging-based progression markers or cerebrovascular reactivity^{17, 18}, these null findings occurred in the context of substantial heterogeneity in treatment initiation, dose intensity, and patient characteristics. In contrast, smaller mechanistic studies and early-phase interventions demonstrated consistent vascular and inflammatory effects^{19–21}. These findings raise the possibility that null findings in the larger trials may partly reflect biological-methodological misalignment, and a true absence of clinically meaningful effect cannot be excluded. Importantly, all included trials focused either exclusively or substantially on ischaemic stroke populations, with only two non-ischaemic strokes represented across all six studies. This is a clear gap in the current literature, as haemorrhagic stroke pathophysiology and therapeutic targets may differ substantially.

An important finding of this review is the dissociation between serum uric acid reduction and vascular or clinical benefit^{19, 20}. These findings reinforce that serum uric acid reduction is a pharmacodynamic marker rather than a mechanistic surrogate. Hence, it is hypothesised that xanthine oxidase-derived oxidative stress, rather than hyperuricaemia itself, represents the relevant therapeutic target. Improvements in central blood pressure¹⁹, augmentation index²⁰, and endothelial activation markers²¹ occurred independently of the magnitude of serum uric acid lowering, indicating that urate reduction alone is an inadequate surrogate marker for therapeutic effect^{7, 20}. This interpretation aligns with experimental evidence implicating oxidative stress and endothelial dysfunction as early, modifiable contributors to secondary neurological injury following ischaemic stroke^{10–12}.

Across included studies, timing of intervention emerged as a potential correlate of therapeutic signal. Notably, the clearest therapeutic signals appeared to occur in trials initiating allopurinol during the hyperacute or early subacute phase^{21, 22}. Reductions in ICAM-1 levels within days of stroke onset²¹, alongside improvements in three-month functional outcomes when treatment was commenced within 24 hours²², suggest that allopurinol may exert its greatest effect during the early inflammatory and endothelial activation phase of stroke pathophysiology. In contrast, delayed initiation months to years after stroke appears unlikely to alter established structural changes, such as white matter hyperintensity progression, that characterise chronic cerebrovascular disease^{17, 18, 20}. This is especially so when assessed using long-term imaging surrogates that are relatively insensitive to early biological modulation. Outcome selection is therefore central to the interpretation of null findings in this literature, particularly those from the largest included trial¹⁸. White matter hyperintensity progression is a slow and multifactorial process influenced by age, hypertension, and pre-existing small vessel disease, and may be relatively insensitive to short- or medium-term modulation of oxidative pathways²³. Accordingly, the absence of meaningful effect on such endpoints should not necessarily be interpreted as cogent evidence against biological activity.

There are also several key limitations in this review. First, the number of trials ($n = 6$) eligible for inclusion in this study was low, and many of these were early-phase studies with small sample sizes, reducing both statistical power and precision. Moreover, the evidence included three studies derived from the same research group and health service in the United Kingdom, which may limit generalisability to other health services and stroke populations. Further, no trials specifically targeted haemorrhagic stroke, and only incidental inclusion of two patients occurred, thereby limiting the applicability of findings to haemorrhagic stroke populations. Finally, many of the outcomes assessed were primarily surrogate or mechanistic, and therefore may not reliably capture clinically meaningful benefit. In light of this, future trials would potentially benefit from the prioritisation of early allopurinol initiation and adequate dose optimisation. Such trials should preferentially study more clearly defined and homogeneous stroke cohorts to improve consistency and

interpretability of findings. If haemorrhagic stroke populations are to be included, this should ideally occur either in dedicated haemorrhagic cohorts or within substantially larger mixed-population trials that are sufficiently powered to allow for pre-specified subgroup analyses.

Conclusion

Xanthine oxidase inhibition using allopurinol produces mixed biological and vascular effects following stroke and does not translate into reliable clinical benefit across heterogeneous trial designs. Any therapeutic potential may be greatest with early initiation and adequate dosing, possibly via attenuation of oxidative and endothelial injury rather than urate reduction. Taken together, the randomised trials included in this review do not support routine allopurinol use following stroke. However, a narrow early therapeutic window remains biologically plausible and warrants future targeted investigation through well-designed acute-phase trials that consider both ischaemic and haemorrhagic stroke populations.

Declarations

Conflicts of Interest:

The authors have no commercial or financial conflicts of interest to declare.

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Author Contributions

DJ (conceptualisation, data extraction, data analysis, manuscript draft, manuscript review and editing); DN (data extraction, data analysis, manuscript review and editing); SB (manuscript review and editing, supervision); TK (manuscript review and editing, supervision); PJP (manuscript review and editing, supervision).

Consent for Publication

All authors have reviewed and approved the manuscript and consent to its submission.

Conflict of Interest

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

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Table

Table 1
Study characteristics of all included articles.

Study	Nation	Study Design	Population	Sample Size	Intervention	Primary Outcome/s
Dawson et al. (2009) ¹⁷	United Kingdom	Randomised, double-blind, placebo-controlled trial	Adults > 18 years with recent subcortical ischaemic stroke (2 weeks–6 months prior)	45 (20 intervention, 25 placebo)	Allopurinol 300 mg orally once daily for 90 days	Change in cerebrovascular reactivity (CVR) – % change in MCA flow velocity 15 min after IV acetazolamide (15 mg/kg; max 1 g), comparing baseline to 3 months; Augmentation index (AI), pulse wave velocity (PWV), VEGF, sICAM, e-selectin, CRP, Serum Uric Acid levels
Dawson et al. (2023) ¹⁸	United Kingdom	Multicentre, prospective, randomised, double-blind, placebo-controlled	Adults > 50 years with ischaemic stroke or TIA within previous 4 weeks	372 (183 allopurinol, 189 placebo)	Allopurinol 300 mg orally daily for first 4 weeks; titrated to 300 mg twice daily	WMH progression; Schmidt's progression score, WMH volume, Fazekas & Scheltens scores, new brain infarction, change in systolic & diastolic BP at week 4 and 104, MoCA score.
Higgins et al. (2014) ¹⁹	United Kingdom	Randomised, double-blind, placebo-controlled trial	Adults (> 18 years) with recent ischaemic stroke or TIA	80 (40 allopurinol, 40 placebo)	Allopurinol 300 mg orally once daily, started the day after baseline assessment, continued for 12 months; matched placebo	Change in carotid intima-media thickness (CIMT) at 12 months (mean common and mean maximum CIMT); Central blood pressure (CBP) and augmentation index at 12 months, brachial blood pressure, endothelial function at 6 months (PAT reactive hyperaemia index, circulating markers: vWF, sICAM-1, e-selectin, thrombomodulin), serum uric acid levels, combined clinical events (recurrent stroke, TIA, myocardial infarction)

Study	Nation	Study Design	Population	Sample Size	Intervention	Primary Outcome/s
Khan et al. (2008) ²⁰	United Kingdom	Prospective, randomised, double-blind, placebo-controlled parallel-group trial	Stroke survivors (≥ 2 years post-event on average) with hyperuricaemia ≥ 0.38 mmol/L	28 (14 allopurinol, 14 placebo)	Allopurinol 300 mg daily for 8 weeks; control matched placebo for 8 weeks	Augmentation Index (AIx) obtained via SphygmoCor pulse-wave analysis; AIx@75 (HR-normalised AIx), time to reflected wave (Tr), BP (central/peripheral), serum uric acid levels
Muir et al. (2008) ²¹	United Kingdom	Prospective, randomised, double-blind, placebo-controlled three-arm trial	Adults > 18 recruited within 72 hours of radiologically confirmed acute ischaemic stroke	50 (17 high-dose allopurinol; 17 low-dose allopurinol; 16 placebo)	High-dose allopurinol (300 mg daily for 6 weeks); Low-dose allopurinol (100 mg daily for 6 weeks); matching placebo arm for 6 weeks	Change in serum uric acid at 6 weeks; change in soluble ICAM-1, CRP, IL-6 at 1 and 6 weeks; safety, NIHSS change
Taheraghdam et al. (2014) ²²	Iran	Prospective, randomised, double-blind, placebo-controlled parallel-group clinical trial	Adults with acute ischemic stroke within 24 h of symptom onset and elevated uric acid (> 6.5 mg/dL women, > 8.2 mg/dL men)	70 (35 allopurinol, 35 placebo)	Allopurinol 200 mg once daily for 90 days; control placebo for 90 days	Functional outcome at 90 days, measured via modified Rankin Scale (mRS) (favourable = 0–2); Mortality, adverse events, serum uric acid levels, NIHSS, predictors of outcome

Legend: BP = Blood Pressure; CRP = C-reactive Protein; IL-6 = Interleukin-6; IV = Intravenous; MCA = Middle Cerebral Artery; NIHSS = National Institutes of Health Stroke Scale; sICAM = soluble Intercellular Adhesion Molecule; TIA = Transient Ischaemic Attack; VEGF = Vascular Endothelial Growth Factor; vWF = von Willebrand Factor; WMH = White Matter Hyperintensity

Figures

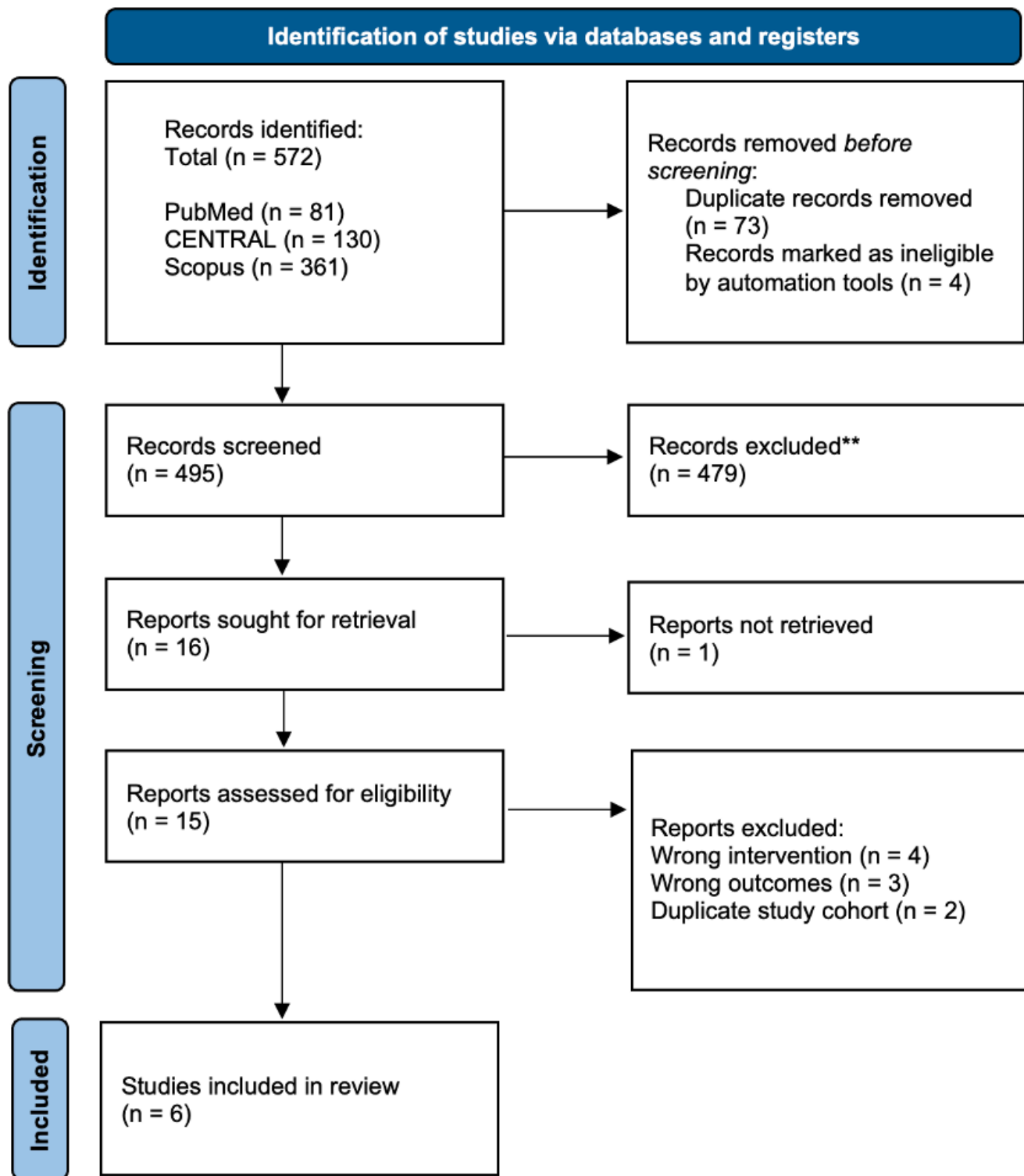


Figure 1

PRISMA flow chart of the article selection process

Supplementary Files

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