nature portfolio

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Reporting Summary

Nature Portfolio wishes to improve the reproducibility of the work that we publish. This form provides structure for consistency and transparency in reporting. For further information on Nature Portfolio policies, see our Editorial Policies and the Editorial Policy Checklist.

Statistics

For all statistical analyses, confirm that the following items are present in the figure legend, table legend, main text, or Methods section.

n/a	Confirmed	
☐	☒	The exact sample size (*n*) for each experimental group/condition, given as a discrete number and unit of measurement
☒	☐	A statement on whether measurements were taken from distinct samples or whether the same sample was measured repeatedly
☐	☒	The statistical test(s) used AND whether they are one- or two-sided *Only common tests should be described solely by name; describe more complex techniques in the Methods section.*
☐	☒	A description of all covariates tested
☐	☒	A description of any assumptions or corrections, such as tests of normality and adjustment for multiple comparisons
☐	☒	A full description of the statistical parameters including central tendency (e.g. means) or other basic estimates (e.g. regression coefficient) AND variation (e.g. standard deviation) or associated estimates of uncertainty (e.g. confidence intervals)
☐	☒	For null hypothesis testing, the test statistic (e.g. *F*, *t*, *r*) with confidence intervals, effect sizes, degrees of freedom and *P* value noted *Give P values as exact values whenever suitable.*
☒	☐	For Bayesian analysis, information on the choice of priors and Markov chain Monte Carlo settings
☒	☐	For hierarchical and complex designs, identification of the appropriate level for tests and full reporting of outcomes
☒	☐	Estimates of effect sizes (e.g. Cohen's *d*, Pearson's *r*), indicating how they were calculated

Our web collection on statistics for biologists contains articles on many of the points above.

Software and code

Policy information about availability of computer code

Data collection	not applicable
Data analysis	not applicable

For manuscripts utilizing custom algorithms or software that are central to the research but not yet described in published literature, software must be made available to editors and reviewers. We strongly encourage code deposition in a community repository (e.g. GitHub). See the Nature Portfolio guidelines for submitting code & software for further information.

Data

Policy information about availability of data

All manuscripts must include a data availability statement. This statement should provide the following information, where applicable:

- Accession codes, unique identifiers, or web links for publicly available datasets
- A description of any restrictions on data availability
- For clinical datasets or third party data, please ensure that the statement adheres to our policy

Requests for data collected for the study can be made to the corresponding authors and will be considered on reasonable request.

Human research participants

Policy information about studies involving human research participants and Sex and Gender in Research.

Reporting on sex and gender	We used the "sex" term. The findings of current study does not apply only one sex. Sex was considered in the study design and was randomly assigned into experimental or control group. We did not collected the data disaggregated sex. Sex-based analysis was not performed.
Population characteristics	Eligible patients were adults aged 18 to 80 years with anterior circulation large vessel occlusion and who achieved sufficient recanalization after endovascular treatment
Recruitment	In this trial, eligible patients were randomly (1:1) assigned using block randomization with block size of four into either experimental group receiving intravenous edaravone dexborneol or control group receiving intravenous placebo. All patients received guideline-based medical management.
Ethics oversight	the ethics committees of the General Hospital of Northern Theatre Command

Note that full information on the approval of the study protocol must also be provided in the manuscript.

Field-specific reporting

Please select the one below that is the best fit for your research. If you are not sure, read the appropriate sections before making your selection.

☒ Life sciences ☐ Behavioural & social sciences ☐ Ecological, evolutionary & environmental sciences

For a reference copy of the document with all sections, see nature.com/documents/nr-reporting-summary-flat.pdf

Life sciences study design

All studies must disclose on these points even when the disclosure is negative.

Sample size	No formal sample size calculation was performed due to no relevant data availability from previous trials.
Data exclusions	Key exclusion criteria were that a patient was older than 80 years given potentially increased risk of renal dysfunction and death in this population; had hemorrhagic transformation (PH2) as indicated by NCCT performed immediately after the procedure; had severe hepatic or renal dysfunction, and severe uncontrolled hypertension (systolic blood pressure over 200mmHg or diastolic blood pressure over 110 mmHg); had malignant tumor with estimated lifetime less than 3 months; or was pregnancy.
Replication	The current findings need to be confirmed in future trials with big sample size.
Randomization	In this trial, eligible patients were randomly assigned into the experiment or control group using a randomization (1:1) method with block randomization (block size: 4) through a computer-generated sequence that was centrally administered via a password-protected, web-based program at https://www.91trial.com (ShangHai Ashermed healthcare communications co., Ltd).
Blinding	double blinded design

Reporting for specific materials, systems and methods

We require information from authors about some types of materials, experimental systems and methods used in many studies. Here, indicate whether each material, system or method listed is relevant to your study. If you are not sure if a list item applies to your research, read the appropriate section before selecting a response.

Materials & experimental systems

n/a	Involved in the study
☒	☐ Antibodies
☒	☐ Eukaryotic cell lines
☒	☐ Palaeontology and archaeology
☒	☐ Animals and other organisms
☐	☒ Clinical data
☒	☐ Dual use research of concern

Methods

n/a	Involved in the study
☒	☐ ChIP-seq
☒	☐ Flow cytometry
☒	☐ MRI-based neuroimaging

Clinical data

Policy information about clinical studies

All manuscripts should comply with the ICMJE guidelines for publication of clinical research and a completed CONSORT checklist must be included with all submissions.

Clinical trial registration	This trial was registered with ClinicalTrials.gov with number NCT04667637
Study protocol	please see study protocol in appendix 2
Data collection	Neurological status, measured with the NIHSS, was assessed at baseline, 24 hours, 48 hours, 7 days, and 12 days after randomization. Demographic and clinical details were obtained at randomization. Follow-up data were collected at 24 hours, 48 hours, 7 days, 12 days (or at hospital discharge if earlier), and 90 days after randomization.
Outcomes	the primary endpoint was the proportion of favorable functional outcome, defined as a mRS of 0–2 at 90 days after randomization