Supplementary

Appendix 1: Bayesian Model Convergence Assessment

1.1 Brooks-Gelman-Rubin diagnostic plots

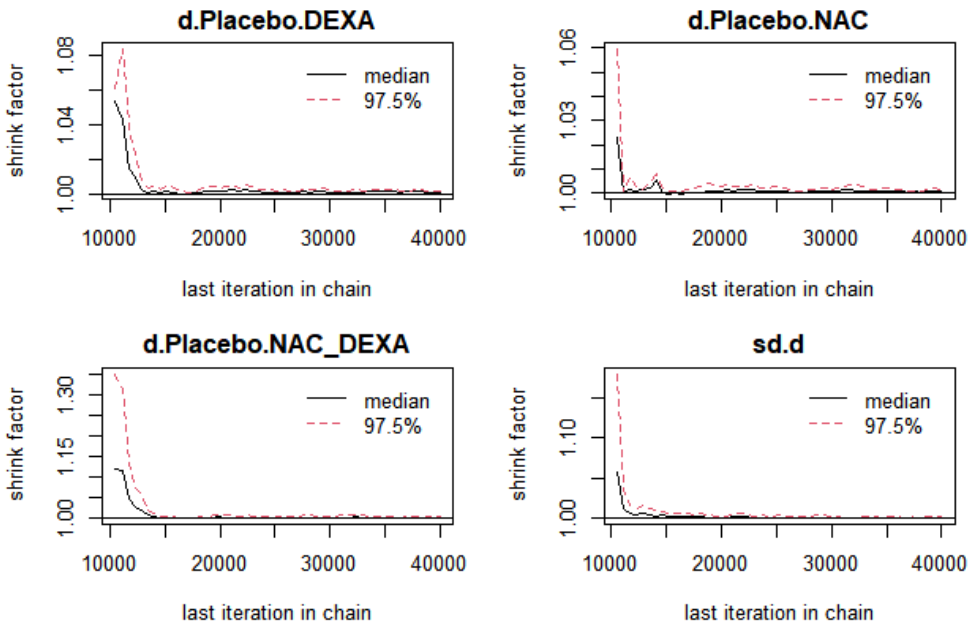

Figure S1 Brooks-Gelman-Rubin diagnostics plot of PES. PES, post-embolization syndrome; DEXA, dexamethasone; NAC, N-acetylcysteine; NAC + DEXA, combination of dexamethasone and N-acetylcysteine.

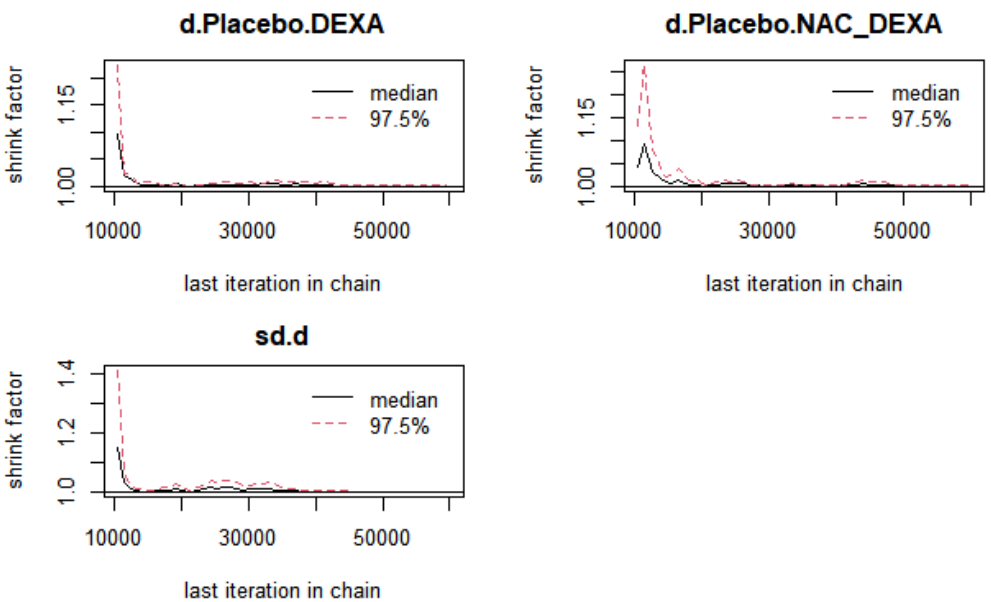

Figure S2 Brooks-Gelman-Rubin diagnostics plot of fever.

https://dx.doi.org/10.21037/tcr-2025-1-2815

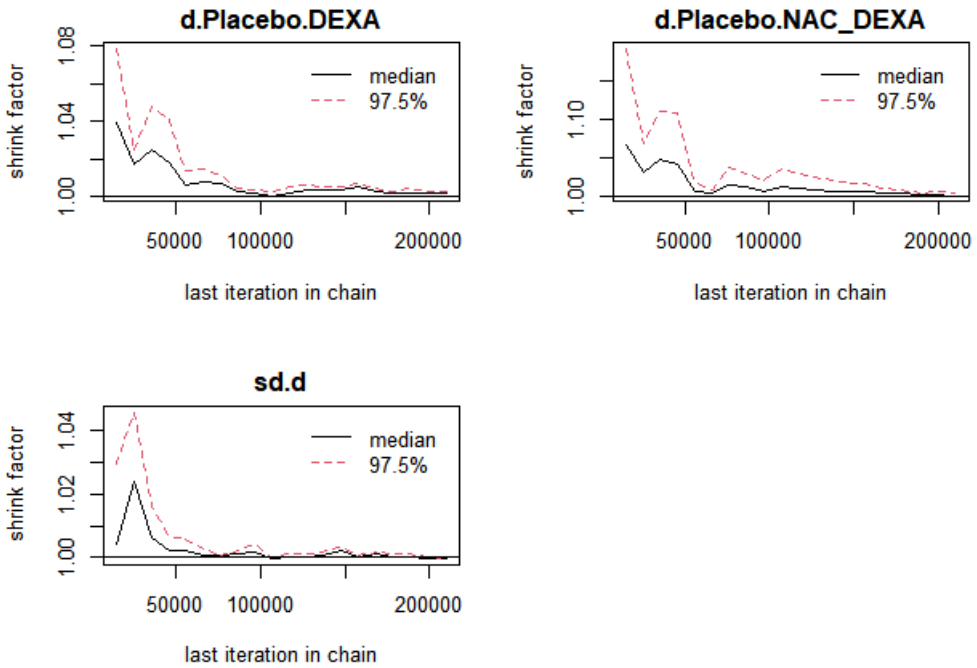

Figure S3 Brooks-Gelman-Rubin diagnostics plot of nausea.

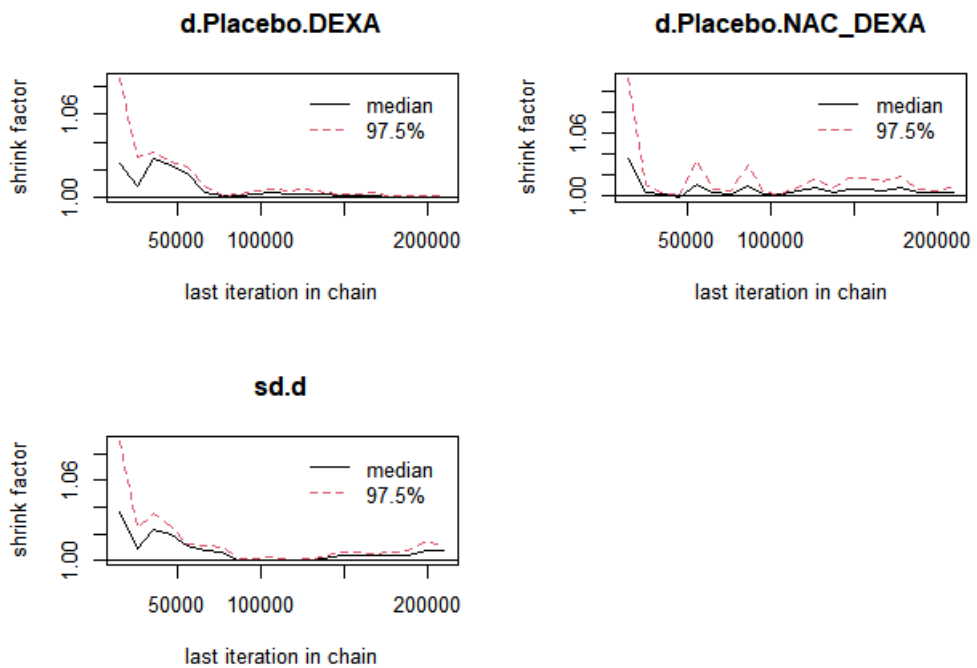

Figure S4 Brooks-Gelman-Rubin diagnostics plot of pain.

https://dx.doi.org/10.21037/tcr-2025-1-2815

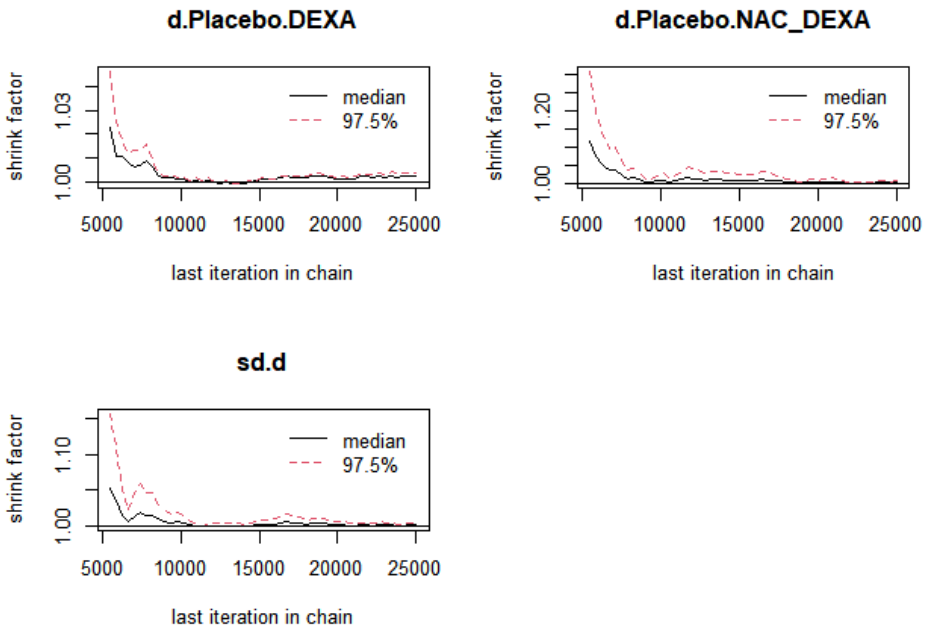

Figure S5 Brooks-Gelman-Rubin diagnostics plot of vomiting.

https://dx.doi.org/10.21037/tcr-2025-1-2815

1.2 Gelman-Rubin PSRF and effective sample sizes

Table S1 Gelman-Rubin PSRF and effective sample sizes

Outcome	Parameter	PSRF Point	PSRF Upper 95% CrI	ESS
PES	d.Placebo.DEXA	1.00	1.00	10929
PES	d.Placebo.NAC	1.00	1.00	11882
PES	d.Placebo.NAC_DEXA	1.00	1.01	2245
PES	sd.d	1.00	1.00	4771
Fever	d.Placebo.DEXA	1.00	1.00	7008
Fever	d.Placebo.NAC_DEXA	1.00	1.01	1549
Fever	sd.d	1.00	1.00	3402
Nausea	d.Placebo.DEXA	1.00	1.00	7685
Nausea	d.Placebo.NAC_DEXA	1.00	1.00	1525
Nausea	sd.d	1.00	1.00	7293
Pain	d.Placebo.DEXA	1.00	1.00	7445
Pain	d.Placebo.NAC_DEXA	1.00	1.01	1587
Pain	sd.d	1.01	1.01	7540
Vomiting	d.Placebo.DEXA	1.00	1.00	7151
Vomiting	d.Placebo.NAC_DEXA	1.00	1.01	1167
Vomiting	sd.d	1.00	1.01	3360

PSRF, potential scale reduction factor; CrI, credible interval; ESS, effective sample sizes; PES, Post-embolization syndrome; DEXA, dexamethasone; NAC, N-acetylcysteine; NAC_DEXA, combination of dexamethasone and N-acetylcysteine.

https://dx.doi.org/10.21037/tcr-2025-1-2815

1.3 Trace plots

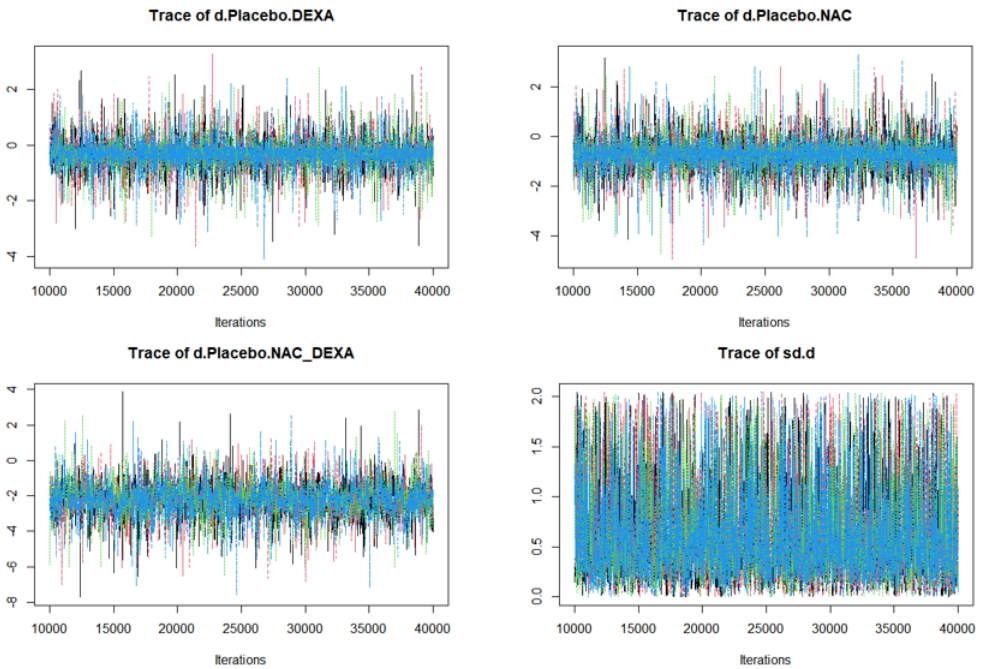

Figure S6 Trace plots for the outcome post-embolization syndrome. DEXA, dexamethasone; NAC, N-acetylcysteine; NAC_DEXA, combination of dexamethasone and N-acetylcysteine.

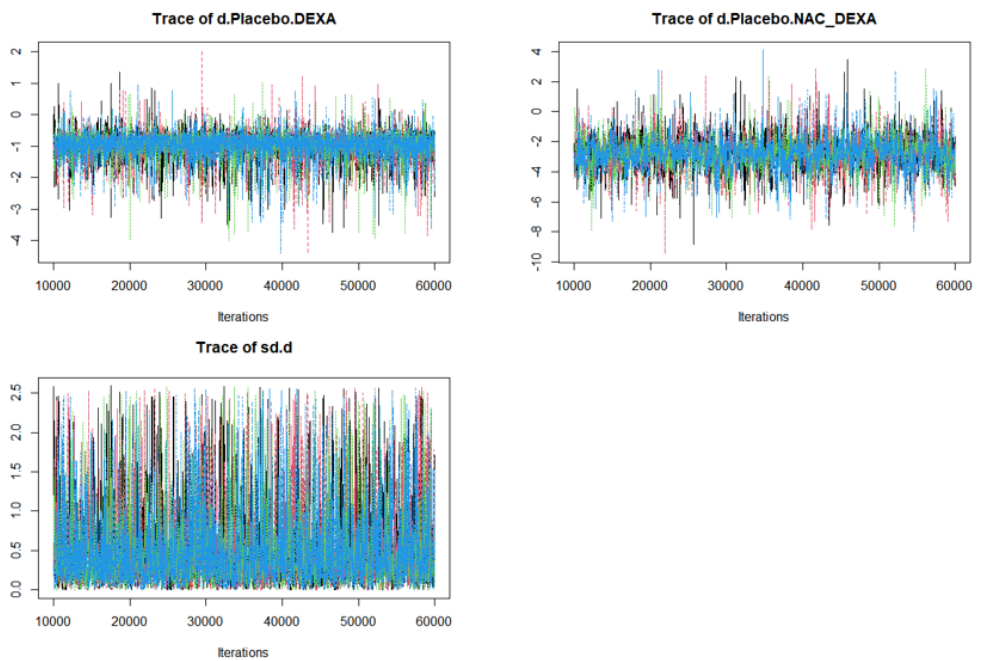

Figure S7 Trace plots for the outcome fever.

https://dx.doi.org/10.21037/tcr-2025-1-2815

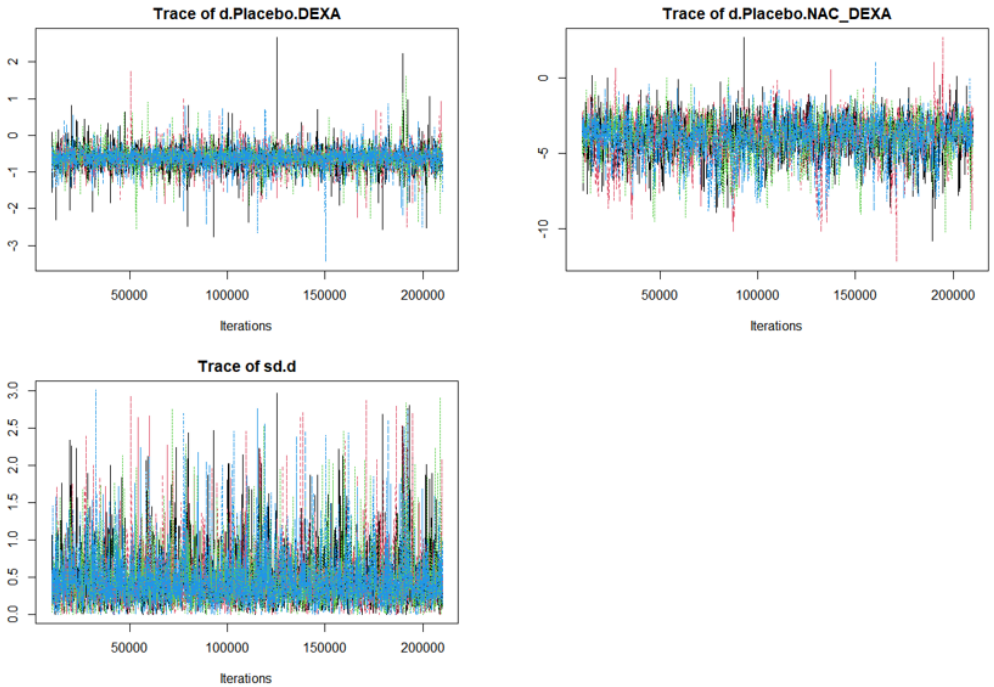

Figure S8 Trace plots for the outcome nausea.

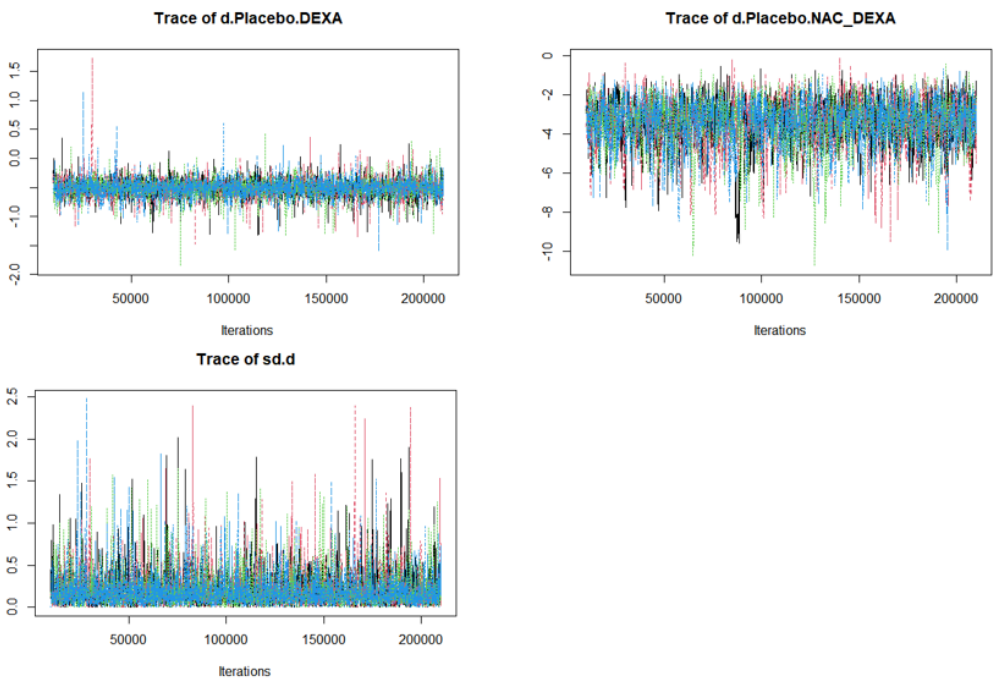

Figure S9 Trace plots for the outcome pain.

https://dx.doi.org/10.21037/tcr-2025-1-2815

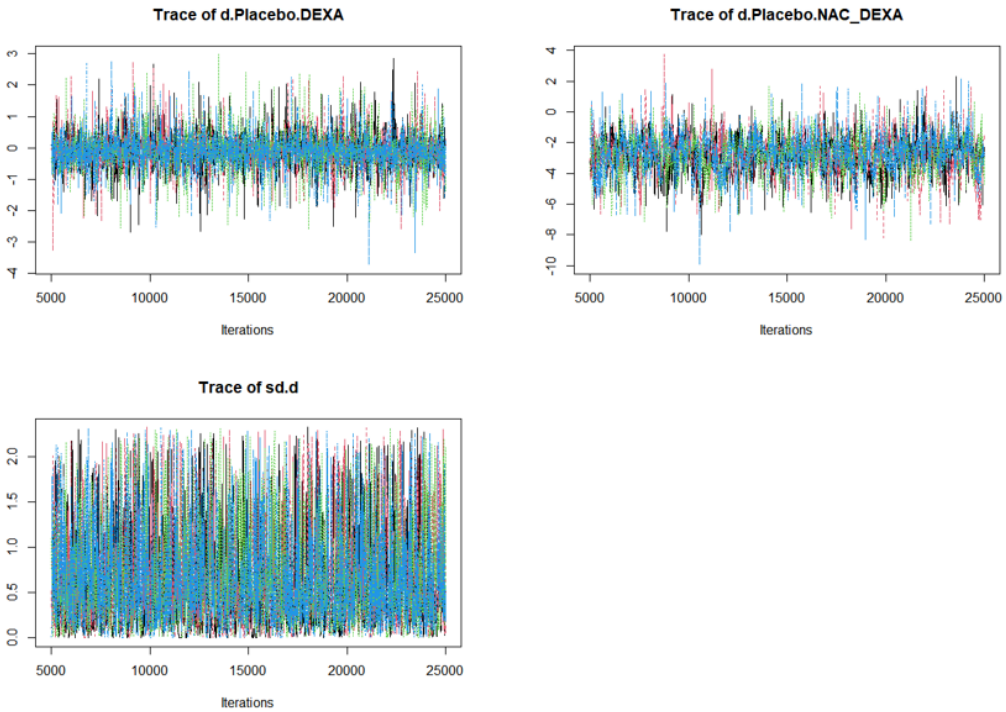

Figure S10 Trace plots for the outcome vomiting.

1.4 Autocorrelation

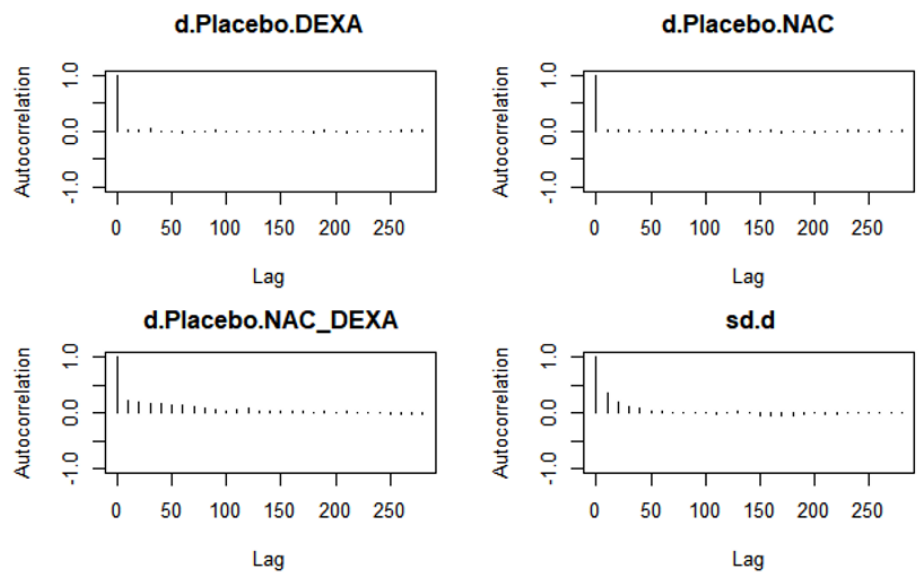

Figure S11 Autocorrelation plots for outcome post-embolization syndrome. DEXA, dexamethasone; NAC, N-acetylcysteine; NAC + DEXA, combination of dexamethasone and N-acetylcysteine.

https://dx.doi.org/10.21037/tcr-2025-1-2815

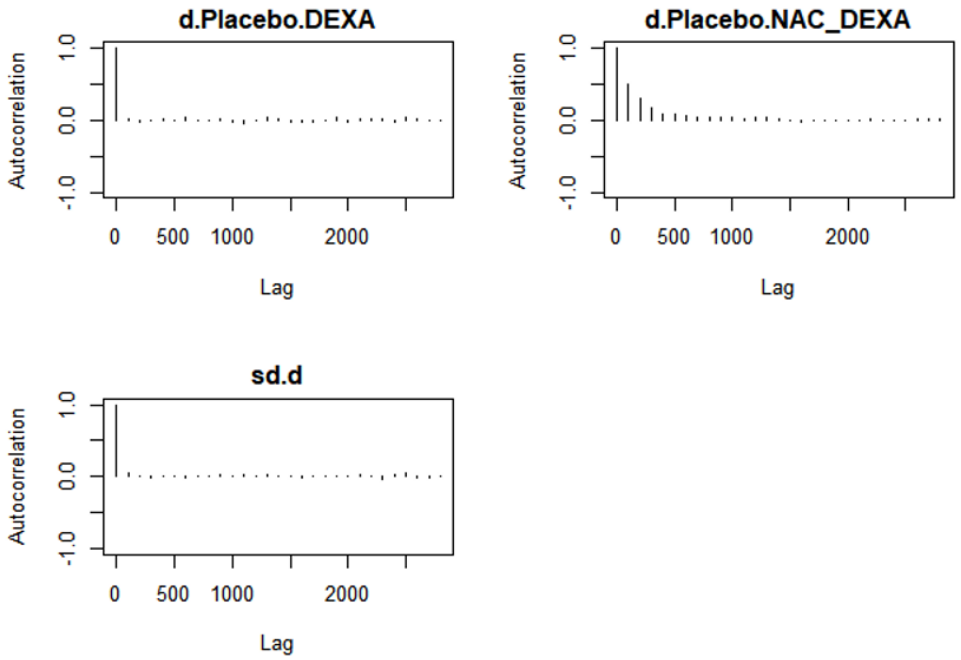

Figure S12 Autocorrelation plots for outcome fever.

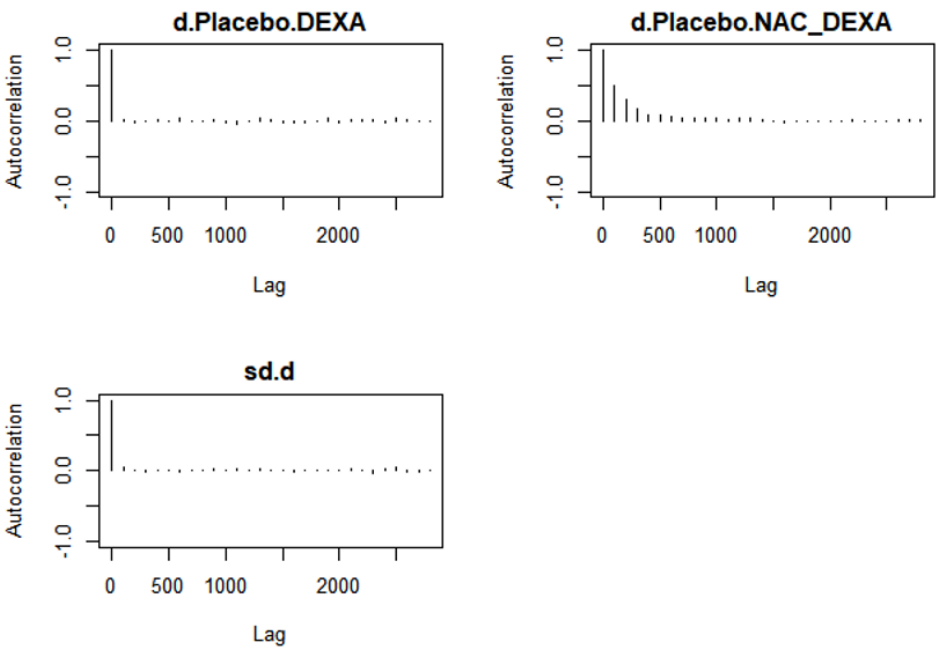

Figure S13 Autocorrelation plots for outcome nausea.

https://dx.doi.org/10.21037/tcr-2025-1-2815

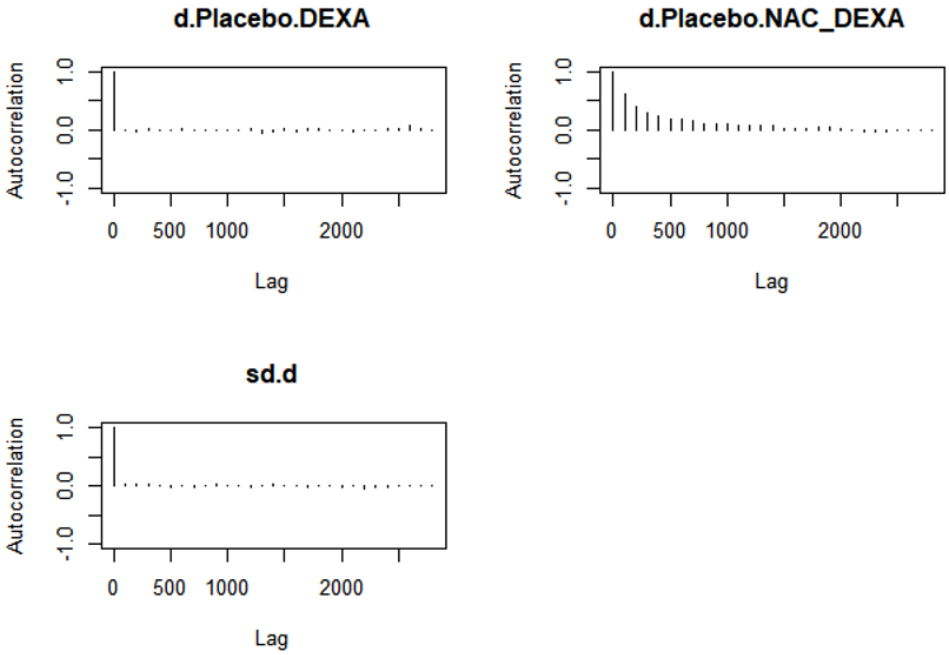

Figure S14 Autocorrelation plots for outcome pain.

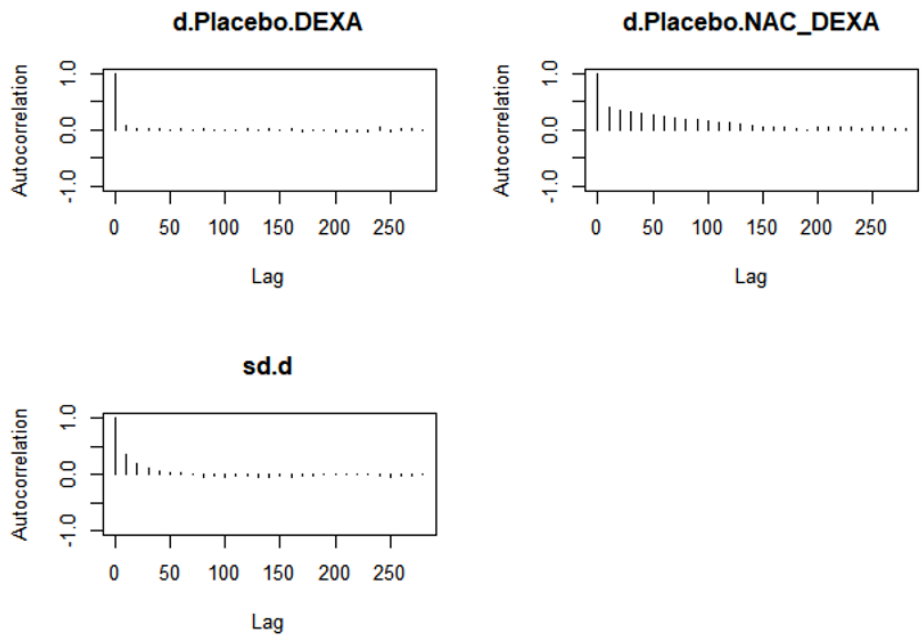

Figure S15 Autocorrelation plots for outcome vomiting.

https://dx.doi.org/10.21037/tcr-2025-1-2815

Appendix 2: The league table

2.1 Outcomes: Post-embolization syndrome

Table S2 League table of risk ratios (RR) with 95% credible intervals for the outcome of post-embolization syndrome

DEXA	0.50 (0.27–0.92)*	NA	1.49 (0.98–2.25)
1.5 (0.40–5.8)	NAC	NA	1.66 (1.11–2.48)*
6.5 (0.80–56)	4.2 (0.48–40)	NAC + DEXA	8.40 (3.63–19.46)*
0.73 (0.25–2.2)	0.48 (0.13–1.8)	0.11 (0.018–0.69)*	Placebo

Upper triangle presents direct comparison results, lower triangle presents network meta-analysis results. All estimates are for the column treatment versus the row treatment. *, significant results. NA, not available; DEXA, dexamethasone; NAC, N-acetylcysteine; NAC + DEXA, combination of dexamethasone and N-acetylcysteine.

2.2 Outcomes: Fever

Table S3 League table of risk ratios (RR) with 95% credible intervals for the outcome of fever

DEXA	NA	2.23 (1.67–2.99)*
6 (0.76–39)	NAC + DEXA	14.00 (4.64–42.22)*
0.4 (0.14–0.67)*	0.065 (0.0095–0.36)*	Placebo

Upper triangle presents direct comparison results, lower triangle presents network meta-analysis results. All estimates are for the column treatment versus the row treatment. *, significant results. NA, not available; DEXA, dexamethasone; NAC + DEXA, combination of dexamethasone and N-acetylcysteine.

2.3 Outcomes: Nausea

Table S4 League table of risk ratios (RR) with 95% credible intervals for the outcome of nausea

DEXA	NA	1.73 (1.33–2.24)*
25 (2.9–720)*	NAC + DEXA	32.00 (4.55–225.23)*
0.55 (0.29–0.94)*	0.022 (0.00076–0.17)*	Placebo

Upper triangle presents direct comparison results, lower triangle presents network meta-analysis results. All estimates are for the column treatment versus the row treatment. *, significant results. NA, not available; DEXA, dexamethasone; NAC + DEXA, combination of dexamethasone and N-acetylcysteine.

2.4 Outcomes: pain

Table S5 League table of risk ratios (RR) with 95% credible intervals for the outcome of pain

DEXA	NA	1.63 (1.34–1.98)*
16 (2.7–410)*	NAC + DEXA	19.00 (2.64–136.56)*
0.60 (0.44–0.81)*	0.037 (0.0015–0.22)*	Placebo

Upper triangle presents direct comparison results, lower triangle presents network meta-analysis results. All estimates are for the column treatment versus the row treatment. *, significant results. NA, not available; DEXA, dexamethasone; NAC + DEXA, combination of dexamethasone and N-acetylcysteine.

https://dx.doi.org/10.21037/tcr-2025-1-2815

2.5 Outcomes: Vomiting

Table S6 League table of risk ratios (RR) with 95% credible intervals for the outcome of vomiting

DEXA	NA	1.13 (0.68–1.86)
13 (1.2–230)*	NAC + DEXA	12.50 (3.13–49.98)*
0.90 (0.30–2.8)	0.067 (0.005–0.56)*	Placebo

Upper triangle presents direct comparison results, lower triangle presents network meta-analysis results. All estimates are for the column treatment versus the row treatment. *, significant results. NA, not available; DEXA, dexamethasone; NAC + DEXA, combination of dexamethasone and N-acetylcysteine.

Appendix 3: Subgroup analysis

All subgroup analyses were performed using random-effects models.

3.1 Outcomes: Fever

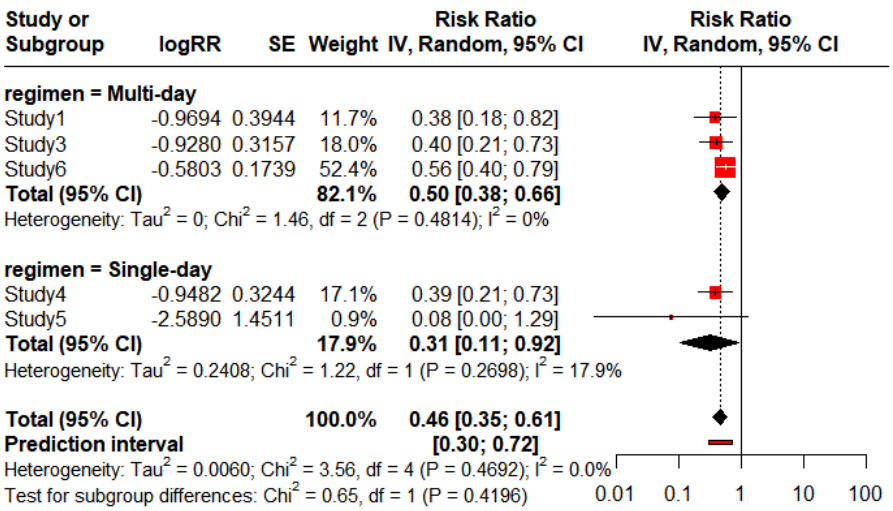

Figure S16 Forest plot of fever comparing multi-day *vs.* single-day administration.

https://dx.doi.org/10.21037/tcr-2025-1-2815

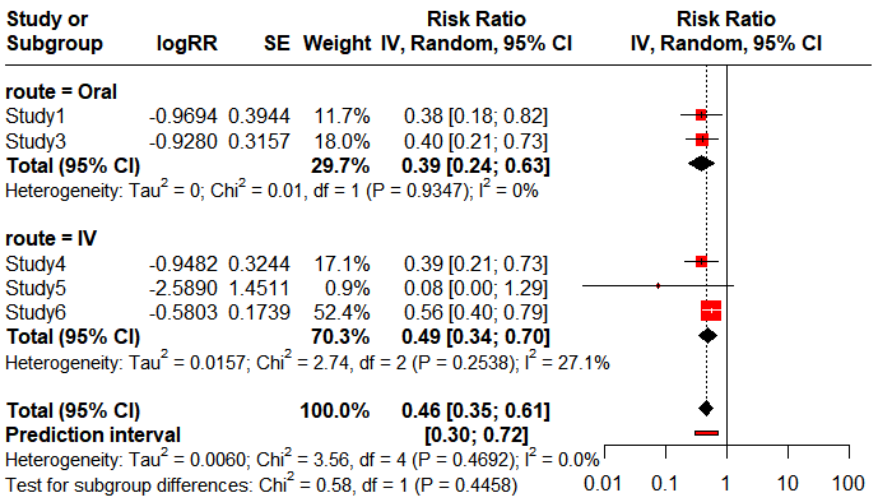

Figure S17 Forest plot of fever comparing oral *vs.* intravenous administration.

https://dx.doi.org/10.21037/tcr-2025-1-2815

3.2 Outcomes: Nausea

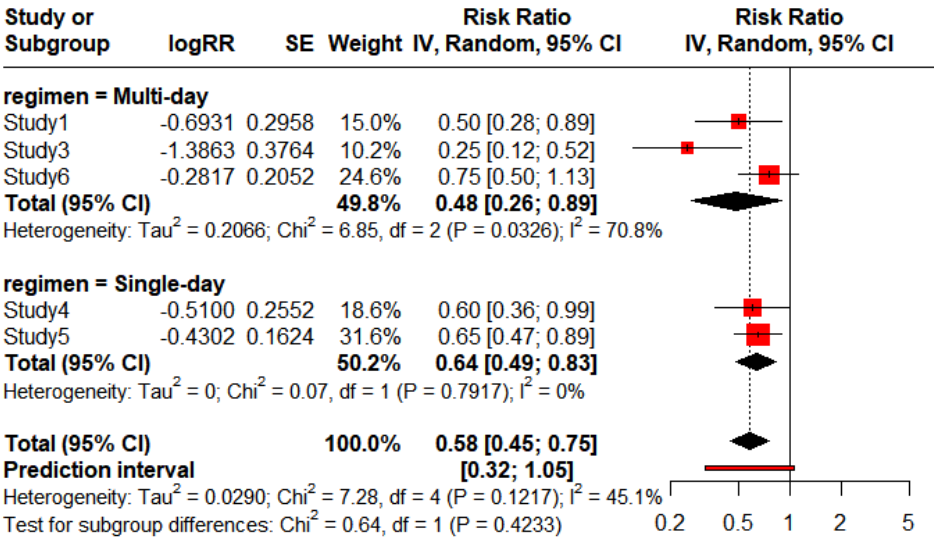

Figure S18 Forest plot of nausea comparing multi-day *vs.* single-day administration.

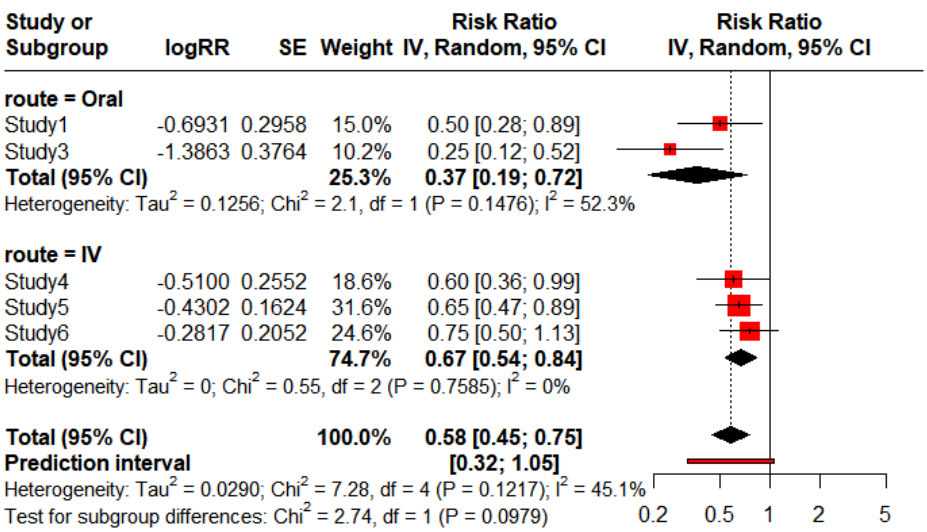

Figure S19 Forest plot of nausea comparing oral *vs.* intravenous administration.

https://dx.doi.org/10.21037/tcr-2025-1-2815

3.3 Outcomes: Pain

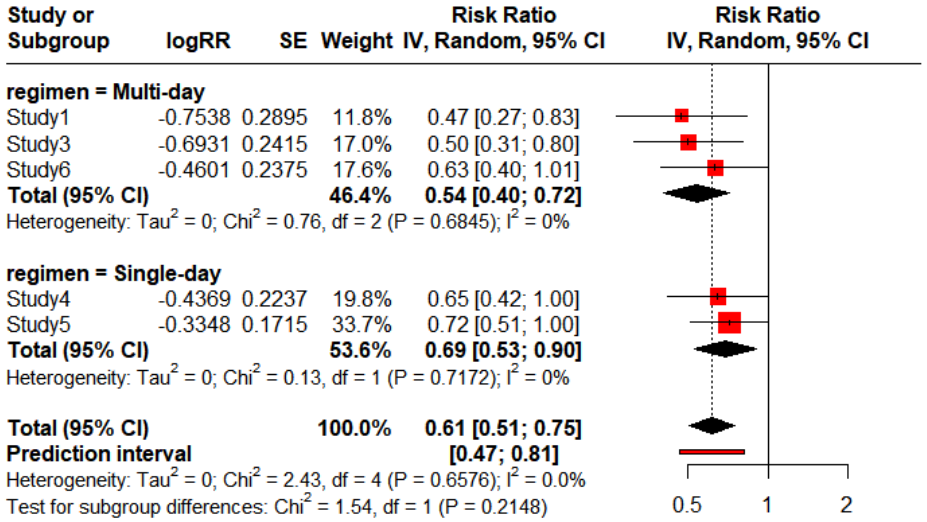

Figure S20 Forest plot of pain comparing multi-day *vs.* single-day administration.

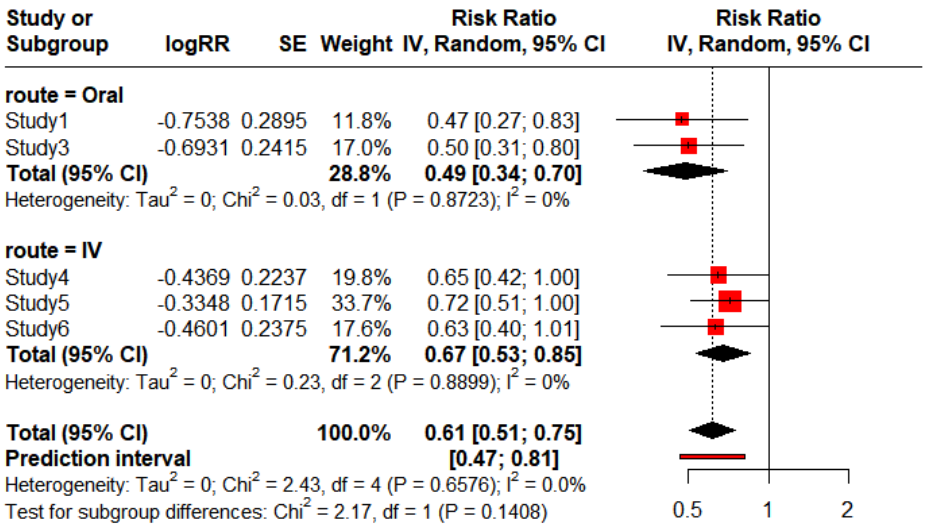

Figure S21 Forest plot of pain comparing oral *vs.* intravenous administration.

https://dx.doi.org/10.21037/tcr-2025-1-2815

3.4 Outcomes: Vomiting

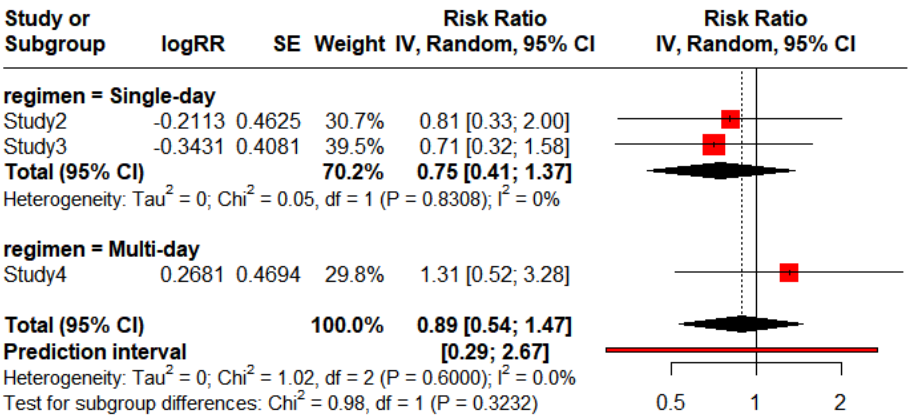

Figure S22 Forest plot of vomiting comparing multi-day *vs.* single-day administration.

https://dx.doi.org/10.21037/tcr-2025-1-2815

Appendix 4: Publication bias

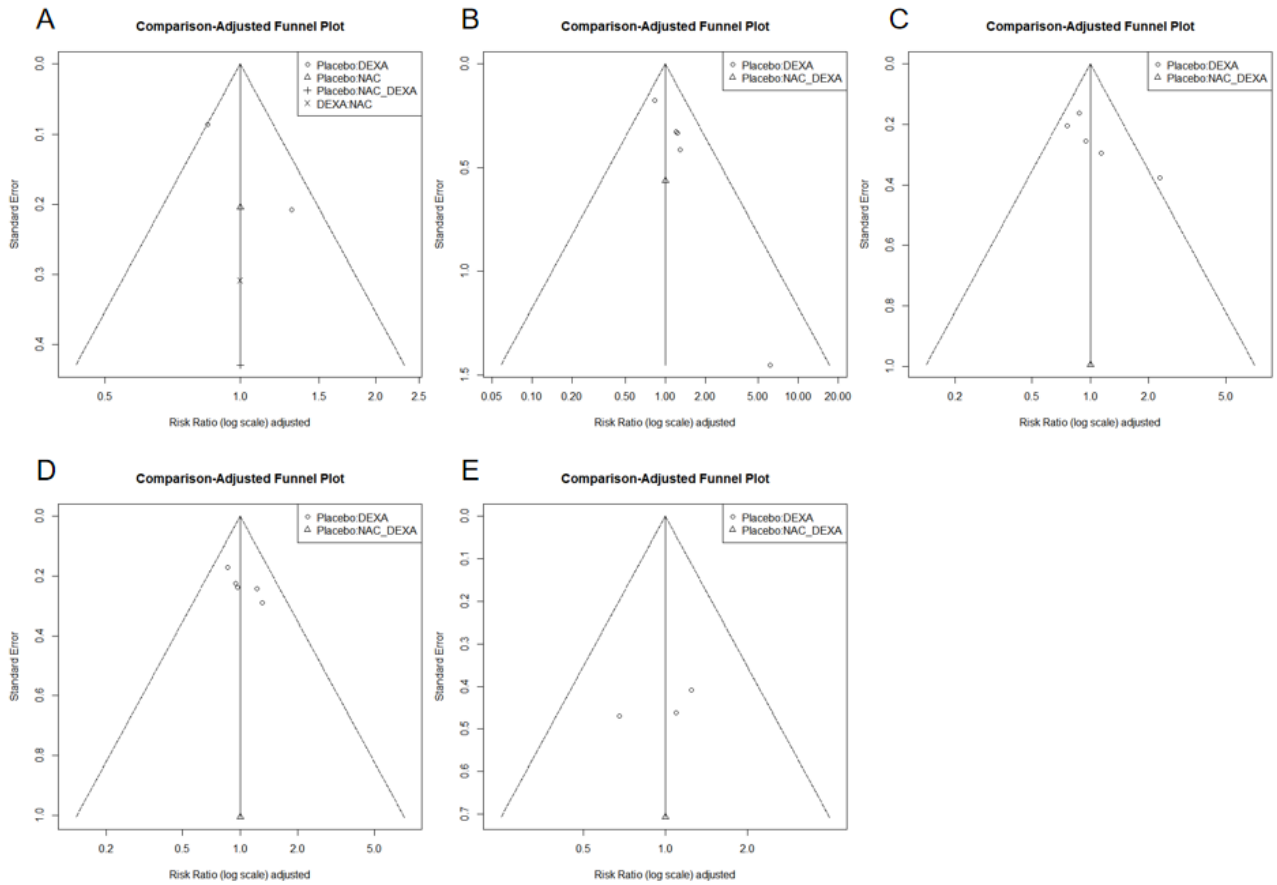

Figure S23 Comparison-adjusted funnel plot for all outcomes: (A) PES; (B) Fever; (C) Nausea; (D) Pain; (E) Vomiting. PES, post-embolization syndrome; DEXA, dexamethasone; NAC, N-acetylcysteine; NAC + DEXA, combination of dexamethasone and N-acetylcysteine.

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Appendix 5: Heterogeneity and inconsistency assessment

5.1 Quantifying heterogeneity

The posterior medians of the between-study heterogeneity (τ) and their 95% credible intervals for each outcome. Values >0.5 are generally considered to indicate substantial heterogeneity. All estimates are based on random-effects models.

Table S7 Posterior median and 95% credible intervals for heterogeneity standard deviation τ across outcomes

Outcome	Median τ	95% credible interval
Post-embolization syndrome	0.476	(0.041–1.789)
Fever	0.342	(0.017–1.923)
Nausea	0.372	(0.031–1.506)
Pain	0.139	(0.007–0.747)
Vomiting	0.463	(0.020–2.030)

5.2 Evaluation of inconsistency

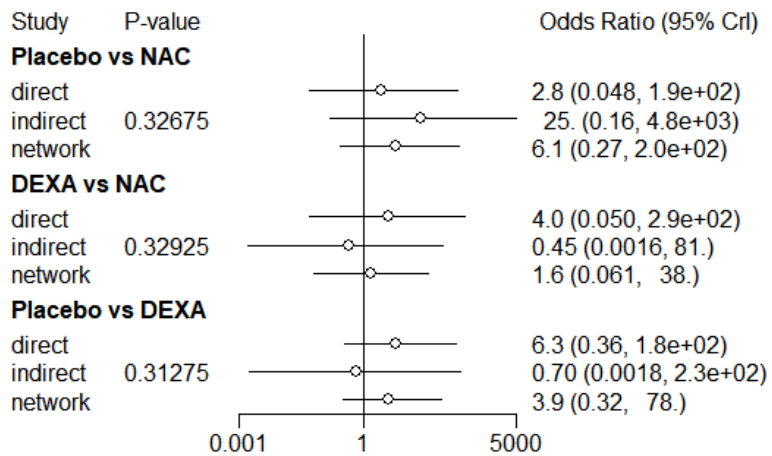

Figure S24 Inconsistency analysis of the network meta-analysis between direct and indirect evidence for post-embolization syndrome. DEXA, dexamethasone; NAC, N-acetylcysteine.

https://dx.doi.org/10.21037/tcr-2025-1-2815

Appendix 6: CINeMA for the outcome "post-embolization syndrome"

Table S8 Confidence in network meta-analysis (CINeMA) ratings for post-embolization syndrome

Comparison	Number of studies	Within-study bias	Reporting bias	Indirectness	Imprecision	Heterogeneity	Incoherence	Overall confidence rating
NAC + DEXA *vs.* Placebo	1	Some concerns	No concerns	No concerns	Some concerns	Some concerns	No concerns	Moderate
NAC + DEXA *vs.* DEXA	0	Some concerns	No concerns	Major concerns	Major concerns	Some concerns	No concerns	Low
NAC + DEXA *vs.* NAC	0	Some concerns	No concerns	Major concerns	Major concerns	Some concerns	No concerns	Low
DEXA *vs.* NAC	1	Some concerns	No concerns	No concerns	Major concerns	Major concerns	No concerns	Low
DEXA *vs.* Placebo	2	Some concerns	No concerns	No concerns	Major concerns	Major concerns	No concerns	Low
NAC *vs.* Placebo	1	Some concerns	No concerns	No concerns	Major concerns	Major concerns	No concerns	Low

DEXA, dexamethasone; NAC, N-acetylcysteine; NAC + DEXA, combination of dexamethasone and N-acetylcysteine.

Appendix 7: Sensitivity analysis

Table S9 Sensitivity analysis for all outcomes excluding non-blinded trials

Outcome	Comparison	Primary analysis RR (95% CrI)	Sensitivity analysis RR (95% CrI)
PES	DEXA *vs.* Placebo	0.73 (0.25–2.2)	0.67 (0.14–2.9)
PES	NAC *vs.* Placebo	0.48 (0.13–1.8)	0.33 (0.02–4.9)
PES	NAC + DEXA *vs.* Placebo	0.11 (0.018–0.69)*	0.11 (0.011–0.99)*
PES	DEXA *vs.* NAC + DEXA	6.5 (0.80–56)	6.1 (0.40–97)
PES	NAC *vs.* NAC + DEXA	4.2 (0.48–40)	3.0 (0.09–101)
PES	DEXA *vs.* NAC	1.5 (0.40–5.8)	2.0 (0.22–19.0)

For PES, this resulted in the exclusion of 1 study, other outcomes were based entirely on double-blind trials and therefore remained unchanged. *, significant results. RR, risk ratios; CrI, credible interval; PES, post-embolization syndrome; DEXA, dexamethasone; NAC, N-acetylcysteine; NAC + DEXA, combination of dexamethasone and N-acetylcysteine.

https://dx.doi.org/10.21037/tcr-2025-1-2815

Table S10 Sensitivity analysis for all outcomes excluding the smallest trial

Outcome	Comparison	Primary analysis RR (95% CrI)	Sensitivity analysis RR (95% CrI)
PES	DEXA *vs.* Placebo	0.73 (0.25–2.2)	0.67 (0.14–2.9)
PES	NAC *vs.* Placebo	0.48 (0.13–1.8)	0.6 (0.07–5.4)
PES	NAC + DEXA *vs.* Placebo	0.11 (0.018–0.69)*	0.11 (0.010–0.95)*
PES	DEXA *vs.* NAC + DEXA	6.5 (0.80–56)	6.2 (0.38–95)
PES	NAC *vs.* NAC + DEXA	4.2 (0.48–40)	5.6 (0.26–136)
PES	DEXA *vs.* NAC	1.5 (0.40–5.8)	1.1 (0.079–14.8)
Fever	DEXA *vs.* Placebo	0.4 (0.14–0.67)*	0.38 (0.078–0.88)*
Fever	NAC + DEXA *vs.* Placebo	0.065 (0.0095–0.36)*	0.061 (0.005–0.642)*
Fever	DEXA *vs.* NAC + DEXA	6 (0.76–39)	6 (0.32–79)
Nausea	DEXA *vs.* Placebo	0.55 (0.29–0.94)*	0.55 (0.2–1.3)
Nausea	NAC + DEXA *vs.* Placebo	0.022 (0.00076–0.17)*	0.021 (0.00051–0.22)*
Nausea	DEXA *vs.* NAC + DEXA	25 (2.9–720)*	27 (2–1211)*
Pain	DEXA *vs.* Placebo	0.60 (0.44–0.81)*	0.63 (0.39–0.94)*
Pain	NAC + DEXA *vs.* Placebo	0.037 (0.0015–0.22)*	0.037 (0.0012–0.24)*
Pain	DEXA *vs.* NAC + DEXA	16 (2.7–410)*	17 (2.6–551)*
Vomiting	DEXA *vs.* Placebo	0.90 (0.30–2.8)	1.03 (0.16–6.0)
Vomiting	NAC + DEXA *vs.* Placebo	0.067 (0.005–0.56)*	0.069 (0.004–0.91)*
Vomiting	DEXA *vs.* NAC + DEXA	13 (1.2–230)*	15 (0.65–397)

*, significant results. RR, risk ratios; CrI, credible interval; PES, post-embolization syndrome; DEXA, dexamethasone; NAC, N-acetylcysteine; NAC + DEXA, combination of dexamethasone and N-acetylcysteine.

Appendix 8: Exploratory meta-regression

Table S11 Exploratory dose-response meta-regression results for secondary outcomes

Outcome	Studies (n)	Coefficient (β)	95% CrI	P value
Fever	5	0.0166	–0.0086, 0.0419	0.197
Nausea	5	–0.0024	–0.0357, 0.0309	0.889
Pain	5	–0.0084	–0.0271, 0.0102	0.376
Vomiting	3	0.0204	–0.0218, 0.0627	0.343

All analyses were performed using random-effects meta-regression models with total dexamethasone dose (mg) as a continuous covariate. Analyses were limited to studies directly comparing dexamethasone with placebo. Coefficient β represents the change in log risk ratio per 1 mg increase in dexamethasone dose.

https://dx.doi.org/10.21037/tcr-2025-1-2815