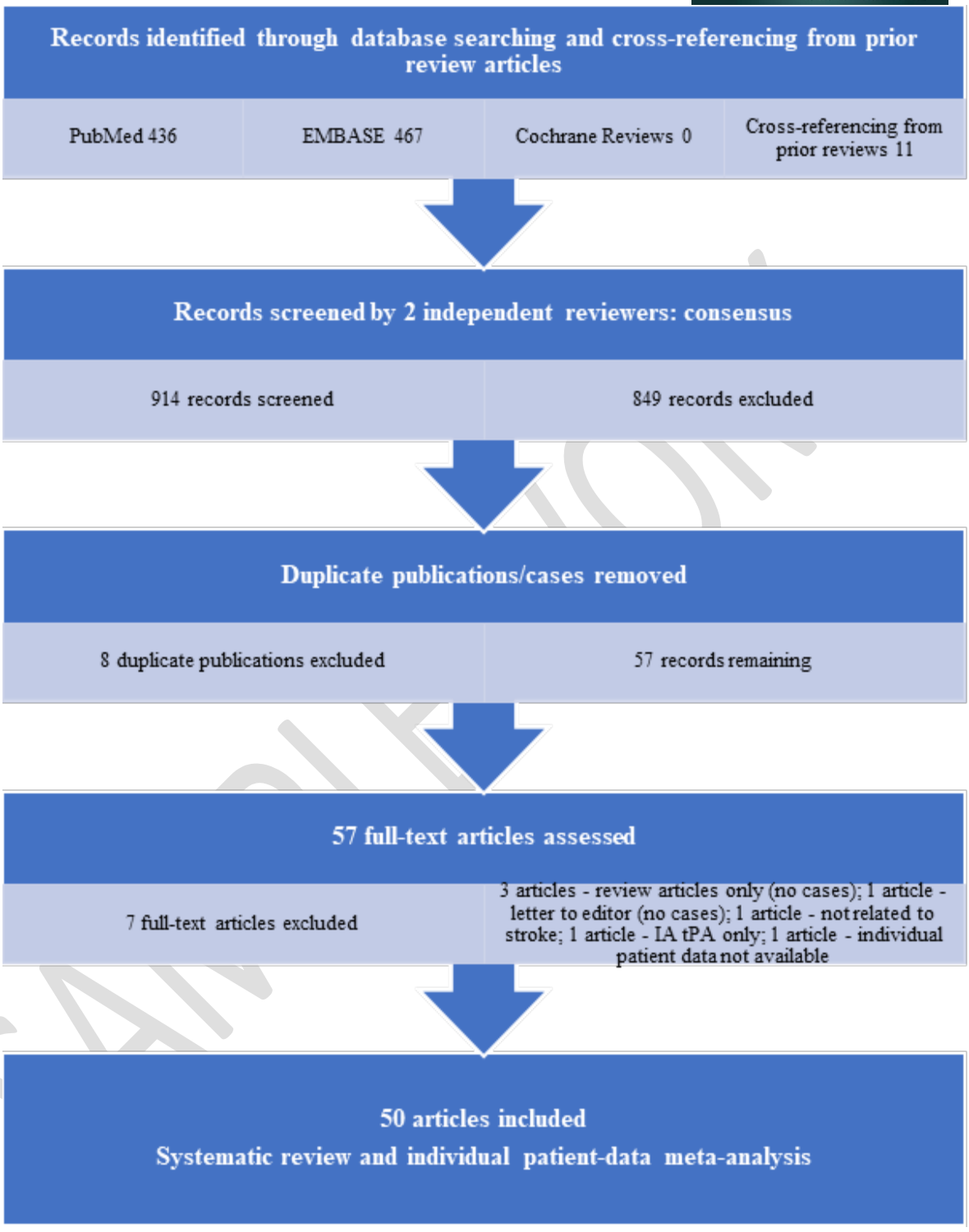
Meta-analysis sample work

Meta-analysis of individual patient data from randomised trials: comparison of approaches and practice suggestions

Title: Meta-analysis of individual patient data from randomised trials: comparison of approaches and practice suggestions

The PRISMA chart, which is depicted above, explains the procedures that must be done to conduct a meta-analysis. First, relevant publications were gathered from various databases, including PubMed and Embase, etc.; next, the two independent reviewers reviewed the collected articles to check them for quality. After completing the screening procedure, the articles list was then updated without any duplicate or irrelevant publications; again, some articles were used to remove from the list of articles because they were not fully texted or they might be irrelevant. Then, 50 articles were chosen for the final Analysis, and the data from those studies were collected. Only the meta-analysis was performed using the programme "Review Manager (REVMAN) 5.3 Copenhagen,"ba sed on those data.



PRISMA Chart

Statistical Analysis

The relative frequencies from the chosen studies were used to estimate the Risk Ratios (RRs) for dichotomous variables. Forest plots were created to quantitatively measure the relevant 95% confidential interval (95% CI) and qualitatively evaluate the RRs across trials. The mean differences were used as an effective measure for continuous data. The Cochrane Q statistic and the I^2 statistic were used to assess the degree of heterogeneity; values of $< 50\%$ and $\geq 50\%$ indicated low and high levels of heterogeneity, respectively. The DerSimonian and Laird random-effects model was used to pool the RRs. "Review Manager (REVMAN) 5.3 Copenhagen" was used to conduct all statistical analyses (The Nordic Cochrane Centre, The Cochrane Collaboration, 2014). A two-sided p-value of 0.05 was regarded as statistically significant for all analyses. Binomial logistic regression is another name for logistic regression analysis. Based on one or more independent variables, this Analysis forecasts the likelihood that an observation will fall into one of two categories of a dichotomous dependent variable. We can only utilise one independent variable and one dependent variable in the linear regression. Linear regression analyses are used to forecast a dependent variable's value based on the independent variable's value.

Table 1.1: Frequency table for final mTICI

Final mTICI	**Frequency**	**Percentage**
0	6	4.62
2a	13	10.00
2b	40	30.77
3	48	36.92
Not reported	12	9.23
Other scale used	11	8.46
Total	130	100.00

Table 1.1 represents the frequency and percentage of final mTICI. The majority of 36.92% of the final mTICI denotes the category of 3, followed by 30.77% of the samples belonging to type 2b. 10.0% and 9.23% belonged to the category of 2a and were not reported, respectively. Other scales were used, and the 0 categories scored only 8.46% and 4.62%, respectively.

Table 1.2 Descriptive statistics for final mRS, Change in NIHSS Score and Age by the distribution of gender

		Final mRS		Change in NIHSS Score		Age	
		Male	**Female**	**Male**	**Female**	**Male**	**Female**
Mean		3.50	3.83	13.86	11.83	12.14	15.50
95% Confidence Interval for Mean	Lower Bound	3.11	3.29	11.03	7.60	10.39	12.25
	Upper Bound	3.89	4.38	16.69	16.07	13.89	18.75
Median		3.50	3.50	12.00	11.50	12.50	15.50
SD		2.37	2.02	7.88	5.53	5.45	4.60

Table 1.2 represents the descriptive statistics values for final mRS, Change in NIHSS Score and Age by the distribution of gender. In the Final mRS, Females scored the highest mean. The mean and standard deviation values were 3.83 ± 2.02 and the male score 3.50 ± 2.37 while considering the change in NIHSS score, the males scored the highest mean, the values were 13.86 ± 7.88, and the female scores 11.83 ± 5.53 and in the case of female age scores the highest mean value of 15.50 ± 4.60 and the male scores the value of 12.14 ± 5.45.

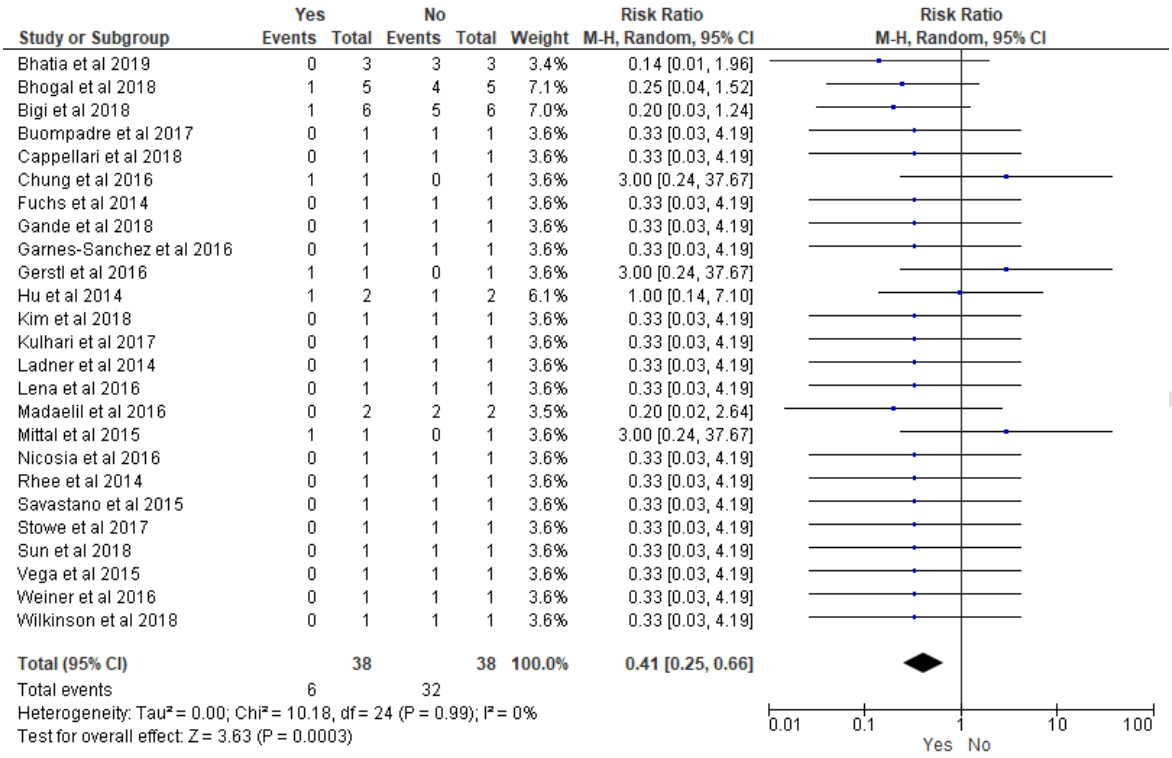
Table 1.3 Descriptive statistics for final mRS, Change in NIHSS Score and Age in terms of the occlusion site

		Mean	95% Confidence Interval for Mean		Median	SD
			Lower Bound	Upper Bound		
Vertebrobasilar	**Final mRS**	3.36	2.23	4.48	2.50	2.72
	Change in NIHSS Score	17.50	10.34	24.66	17.50	9.25
	Age	11.93	8.43	15.42	12.50	5.28
M1	**Final mRS**	3.67	3.30	4.03	3.50	2.08
	Change in NIHSS Score	12.58	9.51	15.65	11.50	6.33

	Age	12.75	10.36	15.15	13.50	5.27
M2	**Final mRS**	-	-	-	-	-
	Change in NIHSS Score	15.50	-48.03	79.03	15.50	8.57
	Age	11.00	-58.88	80.88	11.00	9.28
ICA terminus	**Final mRS**	3.93	3.43	4.42	3.50	2.04
	Change in NIHSS Score	10.21	6.77	13.66	9.50	5.23
	Age	14.50	10.84	18.16	14.50	5.46

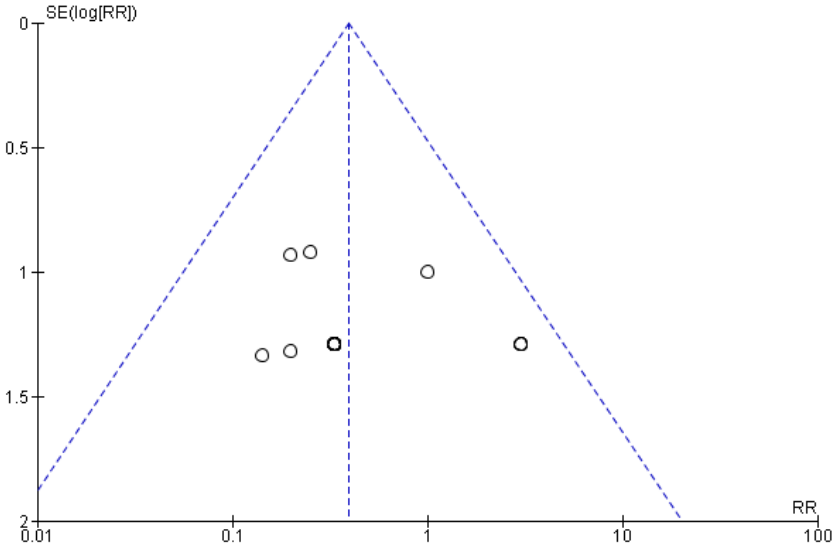
Table 1.3 represents the descriptive statistics for the final mRS, Change in NIHSS Score and Age in terms of occlusion site. The occlusion sites are Vertebrobasilar, M1, M2 and ICA terminus. In the Vertebrobasilar site, the mean was high at Change in NIHSS score, and the values are 17.50 ± 9.25, followed by age, the mean and standard deviation values are 11.93 ± 5.28, and Final mRS has only the value of 3.36 ±2.72. In the M1 site, the mean score was high at age 12.75 ± 5.27, followed by a Change in NIHSS score of 12.58 ± 6.33 and Final mRS scores of only 3.67 ± 2.08. In the case of the M2 area, the highest mean value was scored by Change in NIHSS score of 15.50 ± 8.57 followed by age, and the values are 11.00 ± 9.28. While considering the ICA terminus site, the highest mean values were scored by age as 14.50 ± 5.46, followed by a Change in NIHSS score. The mean and standard deviation values are 10.21 ± 5.23, and the final mRS scores are only 3.93 ± 2.04.

Comparison of IVT between presence and absence in patients



The above figure compares the absence and presence of patients in events for IVT by forest plot. Twenty-five studies reported the meta-analysis between the presence and absence of events for patients in IVT. The study reported a significant difference between the presence and absence of events in patients ($p<0.05$). The heterogeneity between the two studies is low (I^2 =0%). Test for overall effect: Z=3.63 ($p=0.0003<0.05$) (RR=0.41 CI: 0.25 to 0.66). Examining the risk of IVT showed that Chi^2 =10.18, P=0.0003, I^2 =0%, and the difference among studies or Tau^2 =0.00.

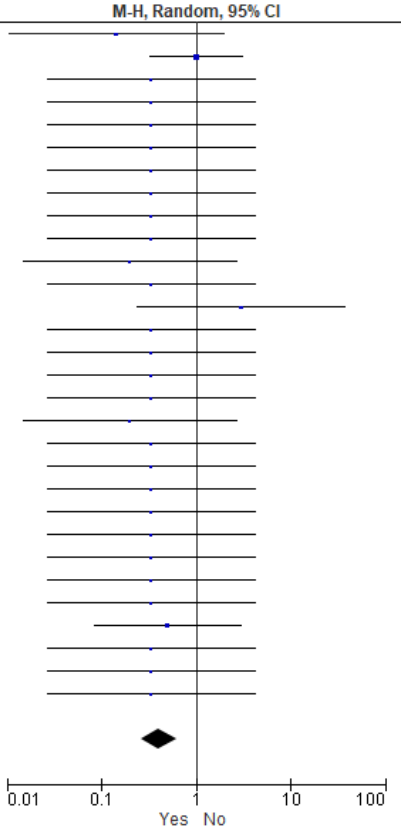
Figure 1.1 Funnel plot for IVT between presence and absence in patients



Comparison of IAT between presence and absence in patients

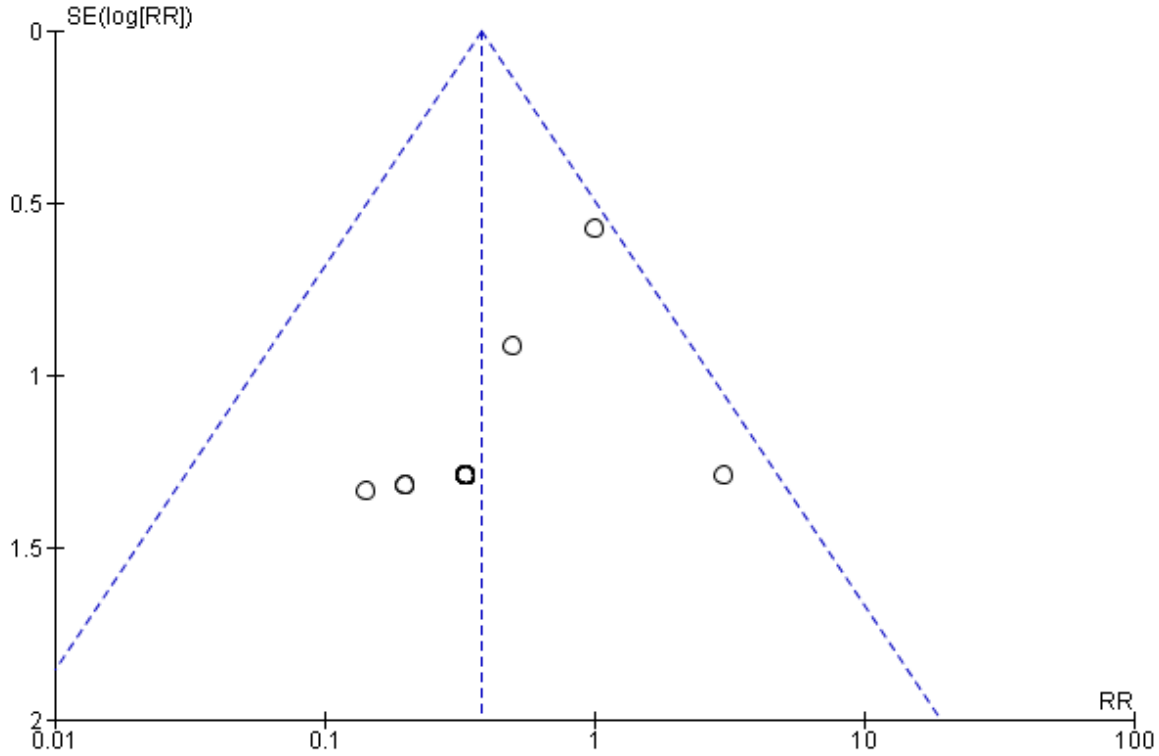
Study or Subgroup	Yes Events	Yes Total	No Events	No Total	Weight	Risk Ratio M-H, Random, 95% CI
Bhatia et al 2019	0	3	3	3	2.7%	0.14 [0.01, 1.96]
Bigi et al 2018	3	6	3	6	14.3%	1.00 [0.32, 3.10]
Buompadre et al 2017	0	1	1	1	2.9%	0.33 [0.03, 4.19]
Cappellari et al 2018	0	1	1	1	2.9%	0.33 [0.03, 4.19]
Chung et al 2016	0	1	1	1	2.9%	0.33 [0.03, 4.19]
Dubedout et al 2013	0	1	1	1	2.9%	0.33 [0.03, 4.19]
Fuchs et al 2014	0	1	1	1	2.9%	0.33 [0.03, 4.19]
Gande et al 2018	0	1	1	1	2.9%	0.33 [0.03, 4.19]
Garnes-Sanchez et al 2016	0	1	1	1	2.9%	0.33 [0.03, 4.19]
Gerstl et al 2016	0	1	1	1	2.9%	0.33 [0.03, 4.19]
Hu et al 2014	0	2	2	2	2.8%	0.20 [0.02, 2.64]
Huded et al 2015	0	1	1	1	2.9%	0.33 [0.03, 4.19]
Irazuzta et al 2010	1	1	0	1	2.9%	3.00 [0.24, 37.67]
Kim et al 2018	0	1	1	1	2.9%	0.33 [0.03, 4.19]
Kulhari et al 2017	0	1	1	1	2.9%	0.33 [0.03, 4.19]
Ladner et al 2014	0	1	1	1	2.9%	0.33 [0.03, 4.19]
Lena et al 2016	0	1	1	1	2.9%	0.33 [0.03, 4.19]
Madaelil et al 2016	0	2	2	2	2.8%	0.20 [0.02, 2.64]
Mittal et al 2015	0	1	1	1	2.9%	0.33 [0.03, 4.19]
Nicosia et al 2016	0	1	1	1	2.9%	0.33 [0.03, 4.19]
Rhee et al 2014	0	1	1	1	2.9%	0.33 [0.03, 4.19]
Sainz de la Maza et al 2014	0	1	1	1	2.9%	0.33 [0.03, 4.19]
Savastano et al 2015	0	1	1	1	2.9%	0.33 [0.03, 4.19]
Stidd et al 2014	0	1	1	1	2.9%	0.33 [0.03, 4.19]
Stowe et al 2017	0	1	1	1	2.9%	0.33 [0.03, 4.19]
Sun et al 2018	0	1	1	1	2.9%	0.33 [0.03, 4.19]
Tabone et al 2017	1	3	2	3	5.7%	0.50 [0.08, 2.99]
Vega et al 2015	0	1	1	1	2.9%	0.33 [0.03, 4.19]
Weiner et al 2016	0	1	1	1	2.9%	0.33 [0.03, 4.19]
Wilkinson et al 2018	0	1	1	1	2.9%	0.33 [0.03, 4.19]
Total (95% CI)		**41**		**41**	**100.0%**	**0.40 [0.26, 0.62]**
Total events	5		36			

Heterogeneity: Tau² = 0.00; Chi² = 6.72, df = 29 (P = 1.00); I² = 0%
Test for overall effect: Z = 4.14 (P < 0.0001)

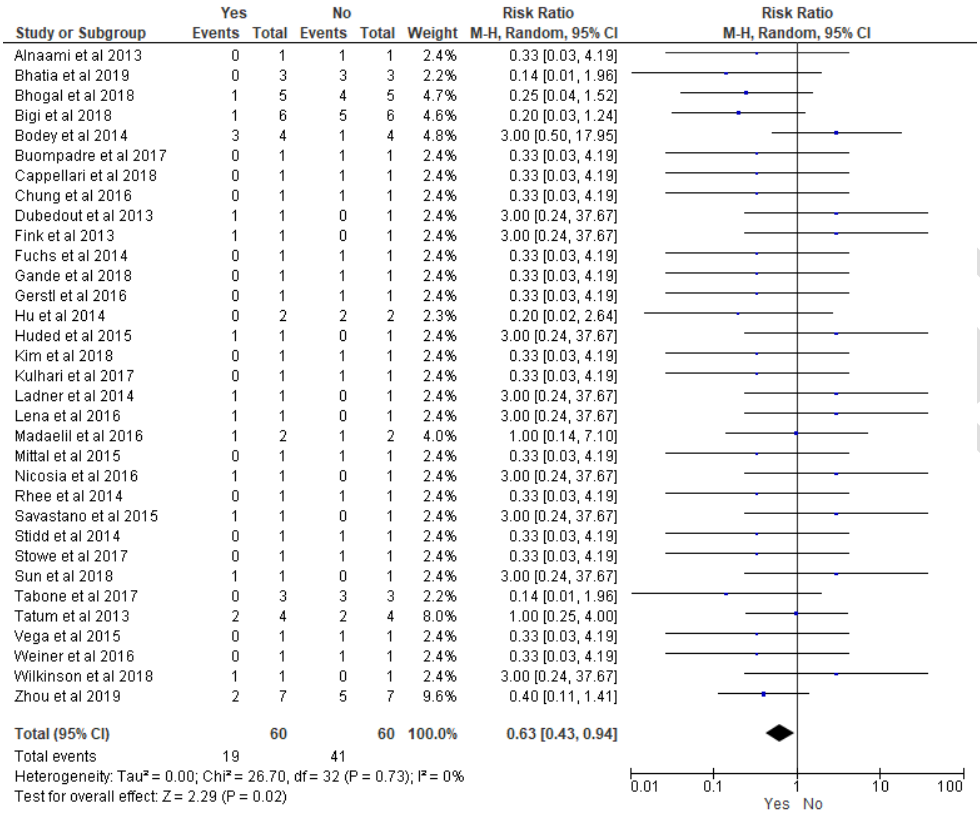


The above figure compares the absence and presence of patients in events for IAT by forest plot. Twenty-five studies reported the meta-analysis between the presence and absence of events for patients in IAT. The study reported a significant difference between the presence and absence of events in patients ($p<0.05$). The heterogeneity between the two studies is low ($I^2=0\%$). The Test for overall effect is $Z=4.14$ ($p=0.0001<0.05$) (RR=0.40 CI: 0.26 to 0.62). Examining the risk of IAT showed that $Chi^2=6.72$, $P=0.0001$, $I^2=0\%$, and the difference among studies or $Tau^2=0.00$.

Figure 1.2 Funnel plot for IAT between presence and absence in patients

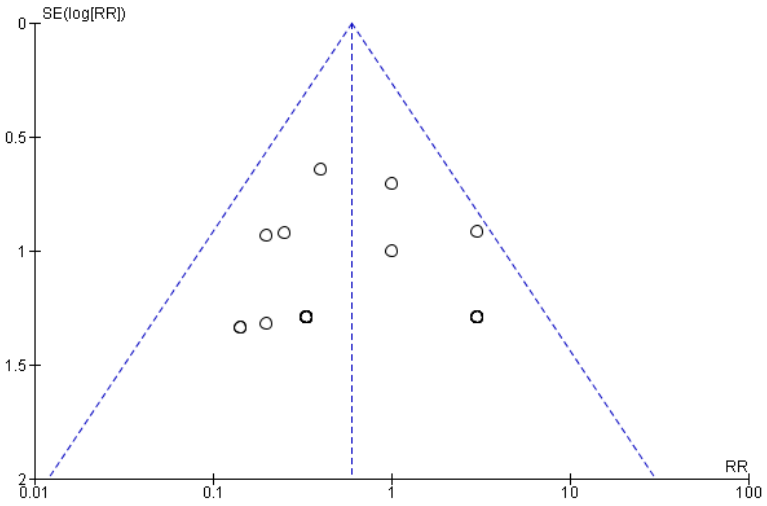


Comparison of Vertebrobasilar between presence and absence in patients



The above figure compares the absence and presence of patients in events for Vertebrobasilar by forest plot. Thirty-three studies reported the meta-analysis between the presence and absence of events for patients in Vertebrobasilar. The study reported a significant difference between the presence and absence of events in patients ($p<0.05$). The heterogeneity between the two studies is low (I^2 =0%). Test for overall effect: Z=2.29 ($p=0.02<0.05$) (RR=0.63 CI: 0.43 to 0.94). Examining the risk of Vertebrobasilar showed that Chi^2 =26.70, P=0.02, I^2 =0%, and the difference among studies or Tau^2 =0.00.

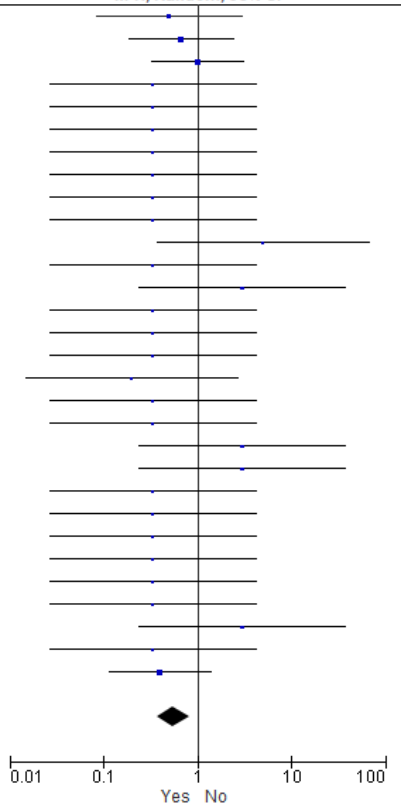
Figure 1.3 Funnel plot for Vertebrobasilar between presence and absence in patients



Comparison of ICA terminus between presence and absence in patients

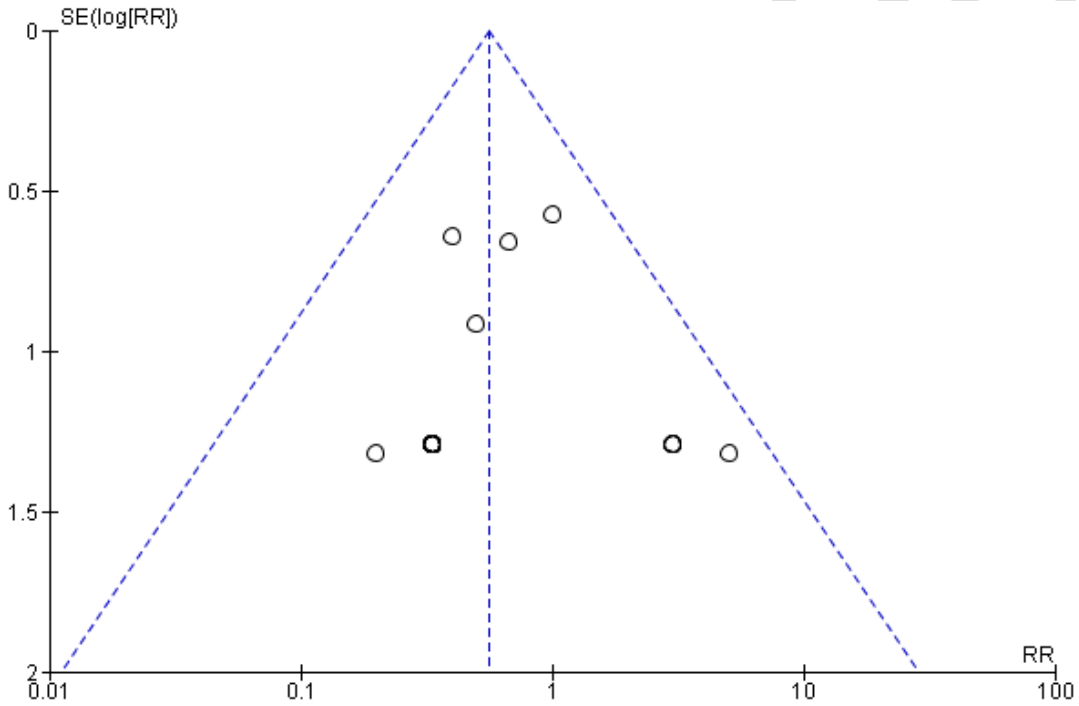
Study or Subgroup	Yes Events	Yes Total	No Events	No Total	Weight	Risk Ratio M-H, Random, 95% CI
Bhatia et al 2019	1	3	2	3	4.9%	0.50 [0.08, 2.99]
Bhogal et al 2018	2	5	3	5	9.4%	0.67 [0.18, 2.42]
Bigi et al 2018	3	6	3	6	12.3%	1.00 [0.32, 3.10]
Buompadre et al 2017	0	1	1	1	2.5%	0.33 [0.03, 4.19]
Cappellari et al 2018	0	1	1	1	2.5%	0.33 [0.03, 4.19]
Chung et al 2016	0	1	1	1	2.5%	0.33 [0.03, 4.19]
Fuchs et al 2014	0	1	1	1	2.5%	0.33 [0.03, 4.19]
Gande et al 2018	0	1	1	1	2.5%	0.33 [0.03, 4.19]
Garnes-Sanchez et al 2016	0	1	1	1	2.5%	0.33 [0.03, 4.19]
Gerstl et al 2016	0	1	1	1	2.5%	0.33 [0.03, 4.19]
Hu et al 2014	2	2	0	2	2.4%	5.00 [0.38, 66.01]
Huded et al 2015	0	1	1	1	2.5%	0.33 [0.03, 4.19]
Kim et al 2018	1	1	0	1	2.5%	3.00 [0.24, 37.67]
Kulhari et al 2017	0	1	1	1	2.5%	0.33 [0.03, 4.19]
Ladner et al 2014	0	1	1	1	2.5%	0.33 [0.03, 4.19]
Lena et al 2016	0	1	1	1	2.5%	0.33 [0.03, 4.19]
Madaelil et al 2016	0	2	2	2	2.4%	0.20 [0.02, 2.64]
Mittal et al 2015	0	1	1	1	2.5%	0.33 [0.03, 4.19]
Nicosia et al 2016	0	1	1	1	2.5%	0.33 [0.03, 4.19]
Rhee et al 2014	1	1	0	1	2.5%	3.00 [0.24, 37.67]
Sainz de la Maza et al 2014	1	1	0	1	2.5%	3.00 [0.24, 37.67]
Savastano et al 2015	0	1	1	1	2.5%	0.33 [0.03, 4.19]
Stidd et al 2014	0	1	1	1	2.5%	0.33 [0.03, 4.19]
Stowe et al 2017	0	1	1	1	2.5%	0.33 [0.03, 4.19]
Sun et al 2018	0	1	1	1	2.5%	0.33 [0.03, 4.19]
Van den Wijngaard et al 2014	0	1	1	1	2.5%	0.33 [0.03, 4.19]
Vega et al 2015	0	1	1	1	2.5%	0.33 [0.03, 4.19]
Weiner et al 2016	1	1	0	1	2.5%	3.00 [0.24, 37.67]
Wilkinson et al 2018	0	1	1	1	2.5%	0.33 [0.03, 4.19]
Zhou et al 2019	2	7	5	7	9.9%	0.40 [0.11, 1.41]
Total (95% CI)		**49**		**49**	**100.0%**	**0.55 [0.37, 0.82]**
Total events	14		35			

Heterogeneity: Tau² = 0.00; Chi² = 14.74, df = 29 (P = 0.99); I² = 0%
Test for overall effect: Z = 2.94 (P = 0.003)

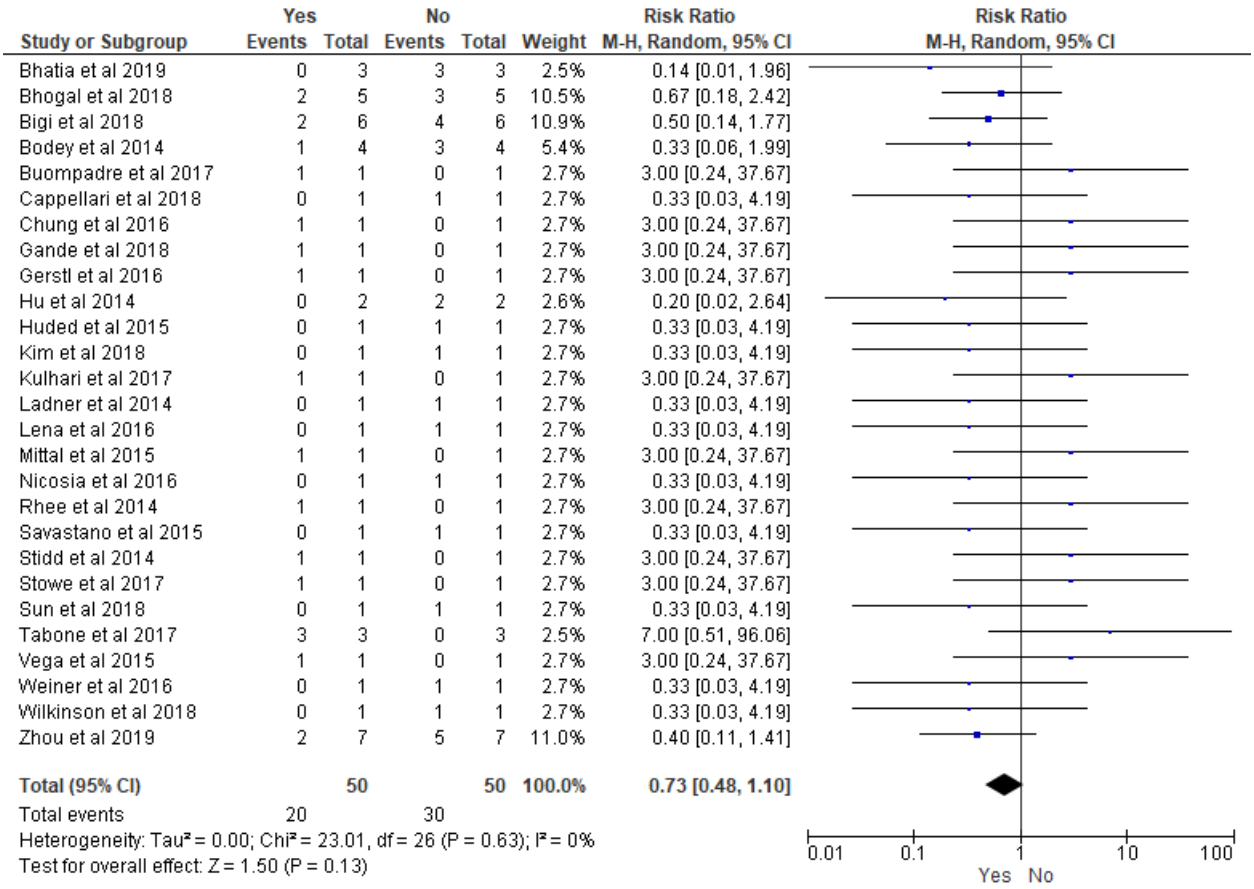


The above figure compares the absence and presence of patients in events for ICA terminus by forest plot. Thirty studies reported the meta-analysis between the presence and absence of events for patients in the ICA terminus. The study reported a significant difference between the presence and absence of events in patients ($p<0.05$). The heterogeneity between the two studies is low (I^2 =0%). Test for overall effect: Z=2.94 (p=0.003<0.05) (RR=0.55 CI: 0.37 to 0.82). Examining the risk of ICA terminus showed that Chi^2 =14.74, P=0.003, I^2 =0% and the difference among studies or Tau^2 =0.00.

Figure 1.4: Funnel plot for ICA terminus between presence and absence in patients



Comparison of M1 between presence and absence in patients

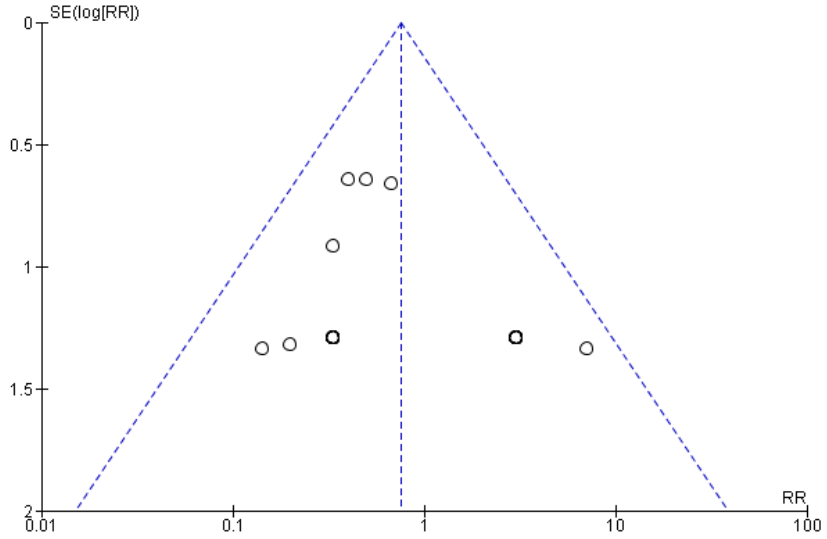


Study or Subgroup	Yes Events	Yes Total	No Events	No Total	Weight	Risk Ratio M-H, Random, 95% CI
Bhatia et al 2019	0	3	3	3	2.5%	0.14 [0.01, 1.96]
Bhogal et al 2018	2	5	3	5	10.5%	0.67 [0.18, 2.42]
Bigi et al 2018	2	6	4	6	10.9%	0.50 [0.14, 1.77]
Bodey et al 2014	1	4	3	4	5.4%	0.33 [0.06, 1.99]
Buompadre et al 2017	1	1	0	1	2.7%	3.00 [0.24, 37.67]
Cappellari et al 2018	0	1	1	1	2.7%	0.33 [0.03, 4.19]
Chung et al 2016	1	1	0	1	2.7%	3.00 [0.24, 37.67]
Gande et al 2018	1	1	0	1	2.7%	3.00 [0.24, 37.67]
Gerstl et al 2016	1	1	0	1	2.7%	3.00 [0.24, 37.67]
Hu et al 2014	0	2	2	2	2.6%	0.20 [0.02, 2.64]
Huded et al 2015	0	1	1	1	2.7%	0.33 [0.03, 4.19]
Kim et al 2018	0	1	1	1	2.7%	0.33 [0.03, 4.19]
Kulhari et al 2017	1	1	0	1	2.7%	3.00 [0.24, 37.67]
Ladner et al 2014	0	1	1	1	2.7%	0.33 [0.03, 4.19]
Lena et al 2016	0	1	1	1	2.7%	0.33 [0.03, 4.19]
Mittal et al 2015	1	1	0	1	2.7%	3.00 [0.24, 37.67]
Nicosia et al 2016	0	1	1	1	2.7%	0.33 [0.03, 4.19]
Rhee et al 2014	1	1	0	1	2.7%	3.00 [0.24, 37.67]
Savastano et al 2015	0	1	1	1	2.7%	0.33 [0.03, 4.19]
Stidd et al 2014	1	1	0	1	2.7%	3.00 [0.24, 37.67]
Stowe et al 2017	1	1	0	1	2.7%	3.00 [0.24, 37.67]
Sun et al 2018	0	1	1	1	2.7%	0.33 [0.03, 4.19]
Tabone et al 2017	3	3	0	3	2.5%	7.00 [0.51, 96.06]
Vega et al 2015	1	1	0	1	2.7%	3.00 [0.24, 37.67]
Weiner et al 2016	0	1	1	1	2.7%	0.33 [0.03, 4.19]
Wilkinson et al 2018	0	1	1	1	2.7%	0.33 [0.03, 4.19]
Zhou et al 2019	2	7	5	7	11.0%	0.40 [0.11, 1.41]
Total (95% CI)		**50**		**50**	**100.0%**	**0.73 [0.48, 1.10]**
Total events	20		30			

Heterogeneity: Tau² = 0.00; Chi² = 23.01, df = 26 (P = 0.63); I² = 0%
Test for overall effect: Z = 1.50 (P = 0.13)

The above figure compares the absence and presence of patients in events for M1 by forest plot. Twenty-seven studies reported the meta-analysis between the presence and absence of events for patients in M1. The study reported no significant difference between the presence and absence of events in patients ($p>0.05$). The heterogeneity between the two studies is low (I^2 =0%). The Test for overall effect is Z=1.50 ($p=0.13 <0.05$) (RR=0.73 CI: 0.48 to 1.10). Examining the risk of M1 showed that Chi^2 =23.01, P=0.13, I^2 =0%, and the difference among studies or Tau^2 =0.00.

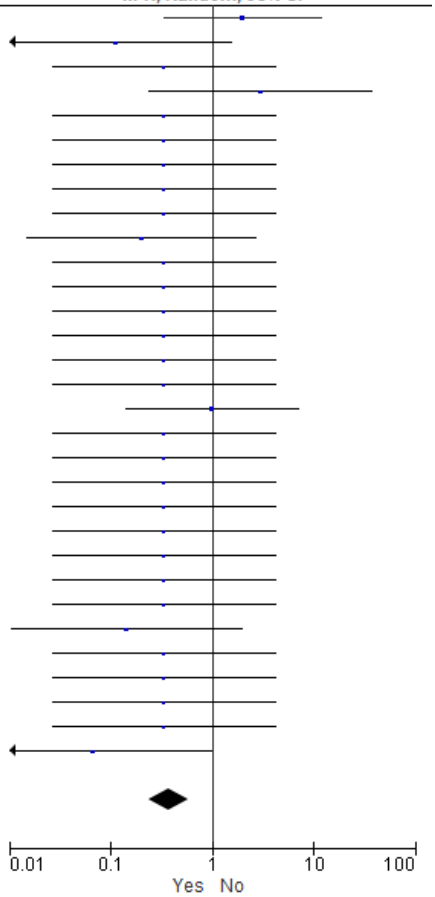
Figure 1.5 Funnel plot for M1 between presence and absence in patients



Comparison of M2 between presence and absence in patients

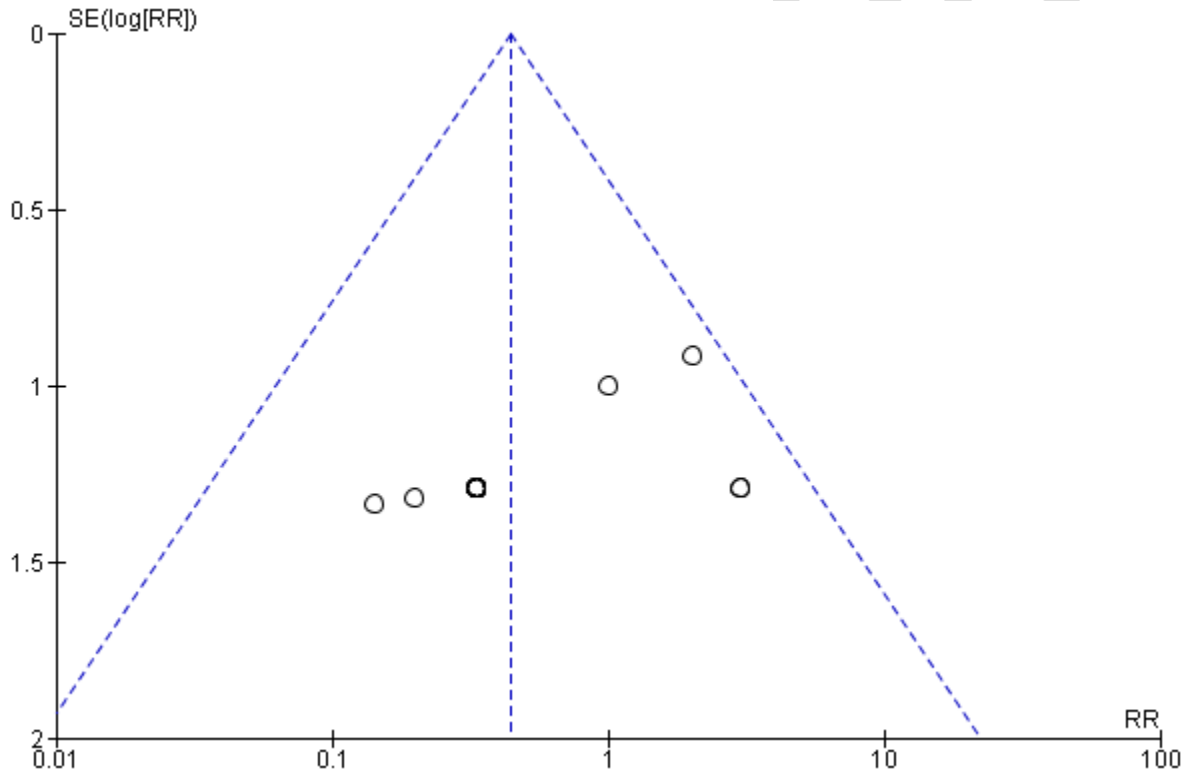
Study or Subgroup	Yes Events	Yes Total	No Events	No Total	Weight	Risk Ratio M-H, Random, 95% CI
Bhatia et al 2019	2	3	1	3	6.2%	2.00 [0.33, 11.97]
Bodey et al 2014	0	4	4	4	2.8%	0.11 [0.01, 1.57]
Buompadre et al 2017	0	1	1	1	3.1%	0.33 [0.03, 4.19]
Cappellari et al 2018	1	1	0	1	3.1%	3.00 [0.24, 37.67]
Chung et al 2016	0	1	1	1	3.1%	0.33 [0.03, 4.19]
Fuchs et al 2014	0	1	1	1	3.1%	0.33 [0.03, 4.19]
Gande et al 2018	0	1	1	1	3.1%	0.33 [0.03, 4.19]
Gerstl et al 2016	0	1	1	1	3.1%	0.33 [0.03, 4.19]
Gunta et al 2012	0	1	1	1	3.1%	0.33 [0.03, 4.19]
Hu et al 2014	0	2	2	2	3.0%	0.20 [0.02, 2.64]
Huded et al 2015	0	1	1	1	3.1%	0.33 [0.03, 4.19]
Kim et al 2018	0	1	1	1	3.1%	0.33 [0.03, 4.19]
Kulhari et al 2017	0	1	1	1	3.1%	0.33 [0.03, 4.19]
Ladner et al 2014	0	1	1	1	3.1%	0.33 [0.03, 4.19]
Lai et al 2010	0	1	1	1	3.1%	0.33 [0.03, 4.19]
Lena et al 2016	0	1	1	1	3.1%	0.33 [0.03, 4.19]
Madaelil et al 2016	1	2	1	2	5.2%	1.00 [0.14, 7.10]
Mittal et al 2015	0	1	1	1	3.1%	0.33 [0.03, 4.19]
Nicosia et al 2016	0	1	1	1	3.1%	0.33 [0.03, 4.19]
Rhee et al 2014	0	1	1	1	3.1%	0.33 [0.03, 4.19]
Sainz de la Maza et al 2014	0	1	1	1	3.1%	0.33 [0.03, 4.19]
Savastano et al 2015	0	1	1	1	3.1%	0.33 [0.03, 4.19]
Stidd et al 2014	0	1	1	1	3.1%	0.33 [0.03, 4.19]
Stowe et al 2017	0	1	1	1	3.1%	0.33 [0.03, 4.19]
Sun et al 2018	0	1	1	1	3.1%	0.33 [0.03, 4.19]
Tabone et al 2017	0	3	3	3	2.9%	0.14 [0.01, 1.96]
Van den Wijngaard et al 2014	0	1	1	1	3.1%	0.33 [0.03, 4.19]
Vega et al 2015	0	1	1	1	3.1%	0.33 [0.03, 4.19]
Weiner et al 2016	0	1	1	1	3.1%	0.33 [0.03, 4.19]
Wilkinson et al 2018	0	1	1	1	3.1%	0.33 [0.03, 4.19]
Zhou et al 2019	0	7	7	7	2.7%	0.07 [0.00, 0.98]
Total (95% CI)		**46**		**46**	**100.0%**	**0.38 [0.24, 0.59]**
Total events	4		42			

Heterogeneity: Tau² = 0.00; Chi² = 10.64, df = 30 (P = 1.00); I² = 0%
Test for overall effect: Z = 4.31 (P < 0.0001)



The above figure represents the comparison of the absence and presence of patients in events for M2 by forest plot. Thirty-one studies reported the meta-analysis between the presence and absence of events for patients in M2. The study reported a significant difference between the presence and absence of events in patients ($p<0.05$). The heterogeneity between the two studies is low (I^2 =0%). The Test for overall effect is Z=4.31 (p=0.0001 <0.05) (RR=0.38 CI: 0.24 to 0.59). Examining the risk of M2 showed that Chi^2 =10.64, P=0.0001, I^2 =0%, and the difference among studies or Tau^2 =0.00.

Figure 1.6: Funnel plot for M2 between presence and absence in patients

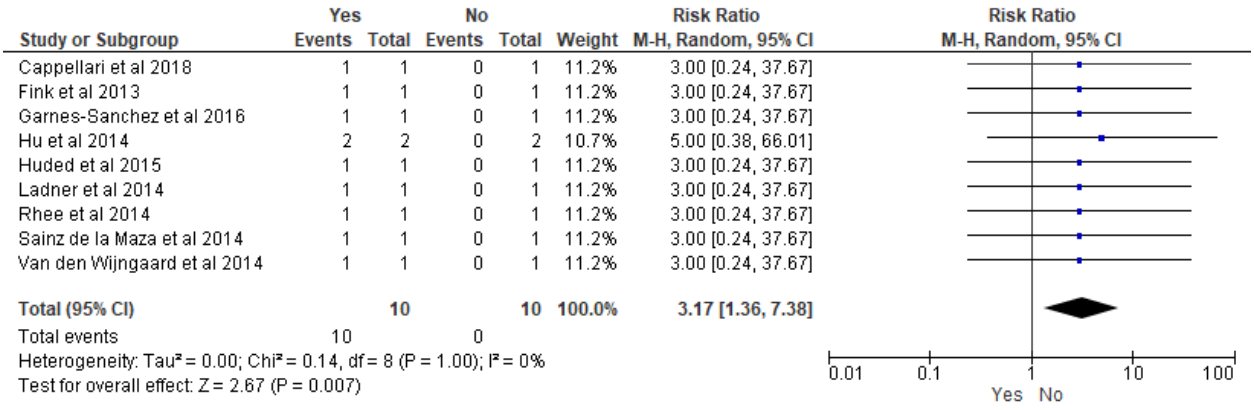


Subgroup analysis assessed with outcomes

The meta-analysis was done for the subgroups analysis assessed with their outcomes for the group of Change in NIHSS. In addition, there are three subgroups in Change in NIHSs: Solitaire, Trevo and Penumbra Aspiration.

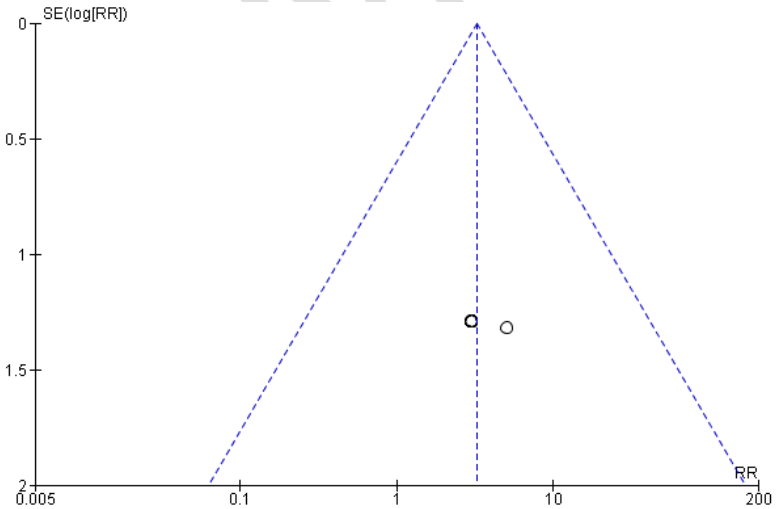
Change in NIHSS

Comparison of change in NIHSS in Solitaire

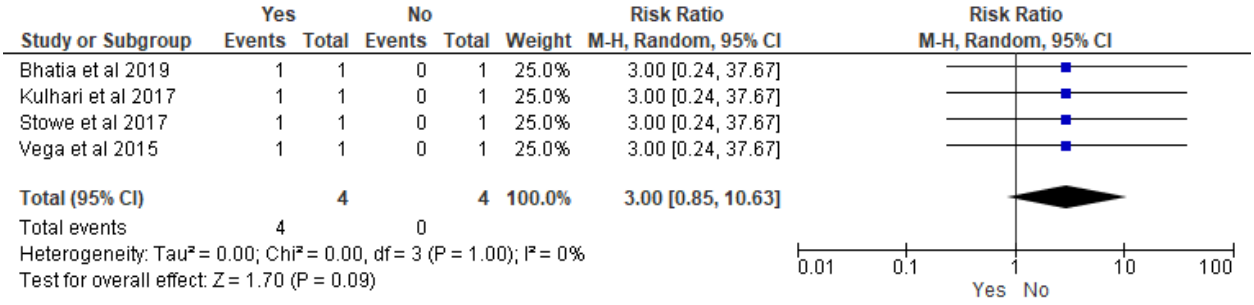


The above figure represents the comparison of the absence and presence of patients in events for the subgroup of Solitaire of Change in NHISS by forest plot. Nine studies reported the meta-analysis between the presence and absence of events for patients in a subgroup of Solitaire. The study reported a significant difference between the presence and absence of events in patients ($p<0.05$). The heterogeneity between the two studies is low (I^2 =0%). The Test for overall effect is Z=2.67 (p=0.007 <0.05) (RR=3.17 CI: 1.36 to 7.38). Examining the risk of Solitaire showed that Chi^2 =0.14, P=0.007, I^2 =0%, and the difference among studies or Tau^2 =0.00.

Figure 1.7: Funnel plot for change in NIHSS in solitaire

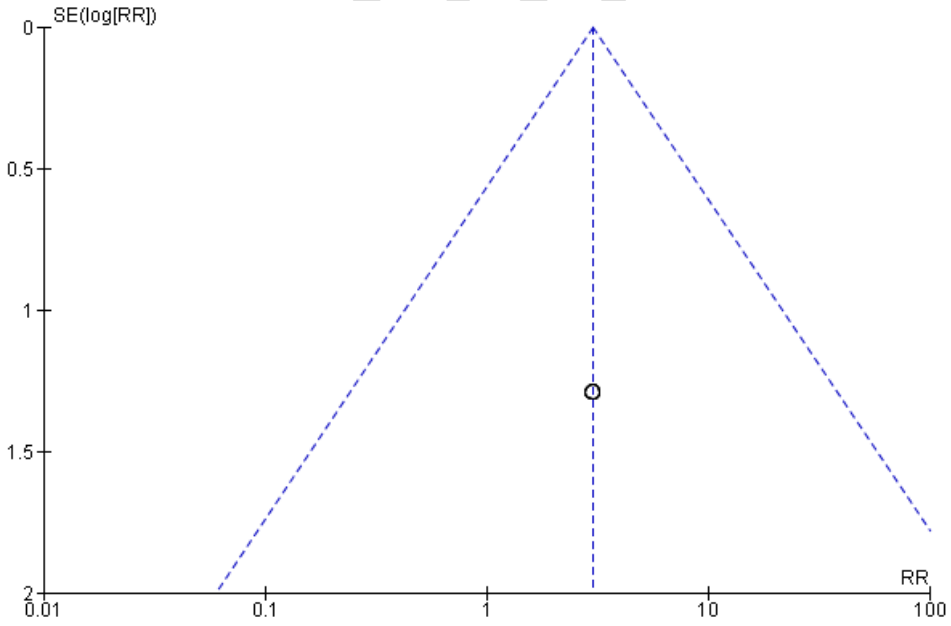


Comparison of change in NIHSS in Trevo

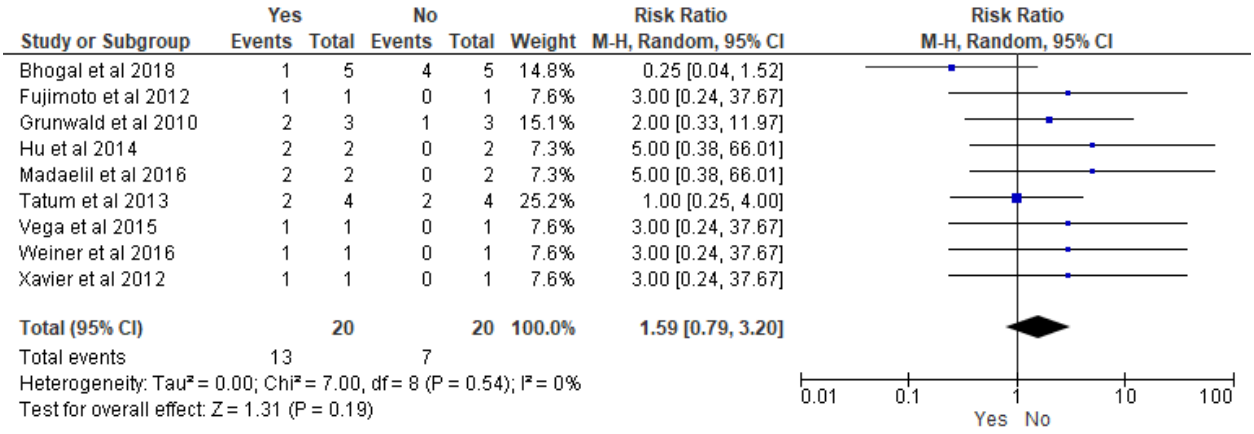


The above figure represents the comparison of the absence and presence of patients in events for the subgroup of Trevo of Change in NHISS by forest plot. Four studies reported the meta-analysis between the presence and absence of events for patients in a subgroup of Trevo. The study reported no significant difference between the presence and absence of events in patients ($p>0.05$). The heterogeneity between the two studies is low (I^2 =0%). The Test for overall effect is Z=1.70 (p=0.09>0.05) (RR=3.00 CI: 0.85 to 10.63). Examining the risk of Trevo showed that Chi^2 =0.00, P=0.09, I^2 =0%, and the difference among studies or Tau^2 =0.00.

Figure 1.8 Funnel plot for change in NIHSS in Trevo



Comparison of change in NIHSS in Penumbra Aspiration



The above figure compares the absence and presence of patients in events for the Penumbra Aspiration of Change subgroup in NHISS by forest plot. Nine studies reported the meta-analysis between the presence and absence of events for patients in a subgroup of Penumbra Aspiration. The study reported no significant difference between the presence and absence of events in patients ($p>0.05$). The heterogeneity between the two studies is low ($I^2=0\%$). The Test for overall effect is $Z=1.31$ ($p=0.19>0.05$) (RR=1.59 CI: 0.79 to 3.20). Examining the risk of Penumbra Aspiration showed that $Chi^2=7.00$, $P=0.19$, $I^2=0\%$ and the difference among studies or $Tau^2=0.00$.

Figure 1.9 Funnel plot for change in NIHSS in Penumbra Aspiration