Supplementary material

Article title: Distinctions between the Koizumi and Longa methods for middle cerebral artery occlusion (MCAO) model: A systematic review and meta-analysis of rodent data
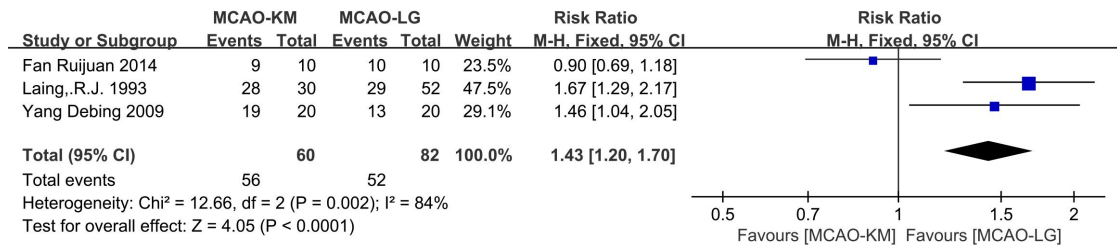
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Study or Subgroup	MCAO-KM Events	Total	MCAO-LG Events	Total	Weight	Risk Ratio M-H, Fixed, 95% CI	Risk Ratio M-H, Fixed, 95% CI
Fan Ruijuan 2014	9	10	10	10	23.5%	0.90 [0.69, 1.18]	
Laing,.R.J. 1993	28	30	29	52	47.5%	1.67 [1.29, 2.17]	
Yang Debing 2009	19	20	13	20	29.1%	1.46 [1.04, 2.05]	
Total (95% CI)		60		82	100.0%	1.43 [1.20, 1.70]	
Total events	56		52				

Heterogeneity: Chi² = 12.66, df = 2 (P = 0.002); I² = 84%
Test for overall effect: Z = 4.05 (P < 0.0001)

0.5   0.7   1   1.5   2
Favours [MCAO-KM] Favours [MCAO-LG]

Figure 1. Forest plot of the filament insertion success rate before sensitivity analysis between the MCAO-KM and the MCAO-LG.

(a) Egger's publication bias plot
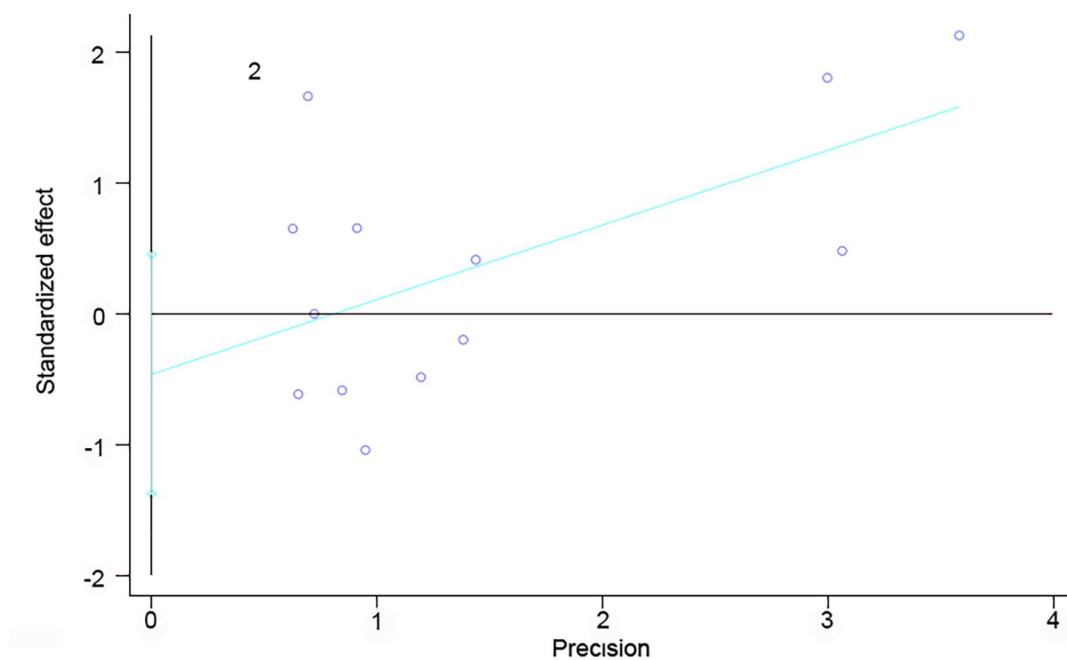
(b) Egger's test

Std_Eff	Coef.	Std. Err.	t	P>|t|	[95% Conf. Interval]
slope	.5709336	.2349298	2.43	0.033	.0538567	1.088011
bias	-.4621282	.4166149	-1.11	0.291	-1.379091	.4548351

Figure 2. Postoperative mortality of MCAO model between the MCAO-KM and the MCAO-LG. (a) Egger's publication bias plot, and (b) Egger's test results.

(a) Forest plot

Study or Subgroup	MCAO-KM Events	Total	MCAO-LG Events	Total	Weight	Risk Ratio M-H, Fixed, 95% CI
2.2.1 Transient middle cerebral artery occlusion						
Fan Ruijuan 2014	9	10	7	10	3.5%	1.29 [0.82, 2.03]
Liu Jianren 2012	9	15	9	15	4.5%	1.00 [0.56, 1.79]
Morris, G.P. 2015	11	17	10	15	5.3%	0.97 [0.59, 1.60]
Onufriev,M.V. 2021	17	30	17	27	8.9%	0.90 [0.59, 1.38]
Qu Qiumin 2000	9	9	6	9	3.2%	1.46 [0.91, 2.35]
Sun Yu 2008	5	6	5	6	2.5%	1.00 [0.60, 1.66]
Trueman, R. C. 2011	12	16	12	15	6.1%	0.94 [0.64, 1.37]
Wang Dongliang 2019	13	18	18	18	9.2%	0.73 [0.54, 0.98]
Wang Wenxiu 2020	21	25	23	25	11.4%	0.91 [0.74, 1.12]
Yang Debing 2009	14	20	12	20	5.9%	1.17 [0.74, 1.85]
Zhao Kai 2012	19	30	6	30	3.0%	3.17 [1.47, 6.81]
Zheng Jianfeng 2016	15	20	16	20	7.9%	0.94 [0.67, 1.31]
Subtotal (95% CI)		216		210	71.3%	1.06 [0.94, 1.20]
Total events	154		141			

Heterogeneity: Chi² = 20.42, df = 11 (P = 0.04); I² = 46%
Test for overall effect: Z = 0.98 (P = 0.33)

Study or Subgroup	MCAO-KM Events	Total	MCAO-LG Events	Total	Weight	Risk Ratio M-H, Fixed, 95% CI
2.2.2 Permanent middle cerebral artery occlusion						
Cam Ertugrul 2008	6	8	5	8	2.5%	1.20 [0.61, 2.34]
Tang Qiqiang 2013 (1)	9	14	5	14	2.5%	1.80 [0.81, 4.02]
Tang Qiqiang 2013 (2)	13	14	10	14	5.0%	1.30 [0.91, 1.87]
Tang Qiqiang 2013 (3)	9	14	6	14	3.0%	1.50 [0.73, 3.08]
Xiang Heng 2008	9	15	5	15	2.5%	1.80 [0.79, 4.11]
Yang Zanzhang 2008	20	25	13	25	6.4%	1.54 [1.01, 2.35]
Zheng Jianfeng 2016	12	20	14	20	6.9%	0.86 [0.54, 1.36]
Subtotal (95% CI)		110		110	28.7%	1.34 [1.09, 1.66]
Total events	78		58			

Heterogeneity: Chi² = 5.31, df = 6 (P = 0.51); I² = 0%
Test for overall effect: Z = 2.76 (P = 0.006)

	MCAO-KM	Total	MCAO-LG	Total	Weight	Risk Ratio M-H, Fixed, 95% CI
Total (95% CI)		326		320	100.0%	1.14 [1.03, 1.27]
Total events	232		199			

Heterogeneity: Chi² = 32.84, df = 18 (P = 0.02); I² = 45%
Test for overall effect: Z = 2.47 (P = 0.01)
Test for subgroup differences: Chi² = 3.56, df = 1 (P = 0.06), I² = 71.9%

Favours [MCAO-KM]   Favours [MCAO-LG]
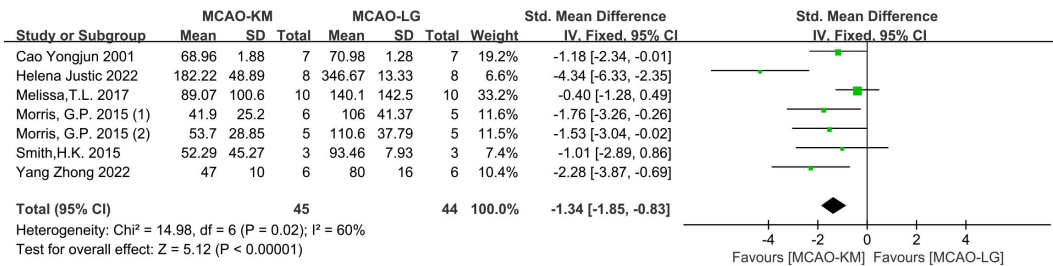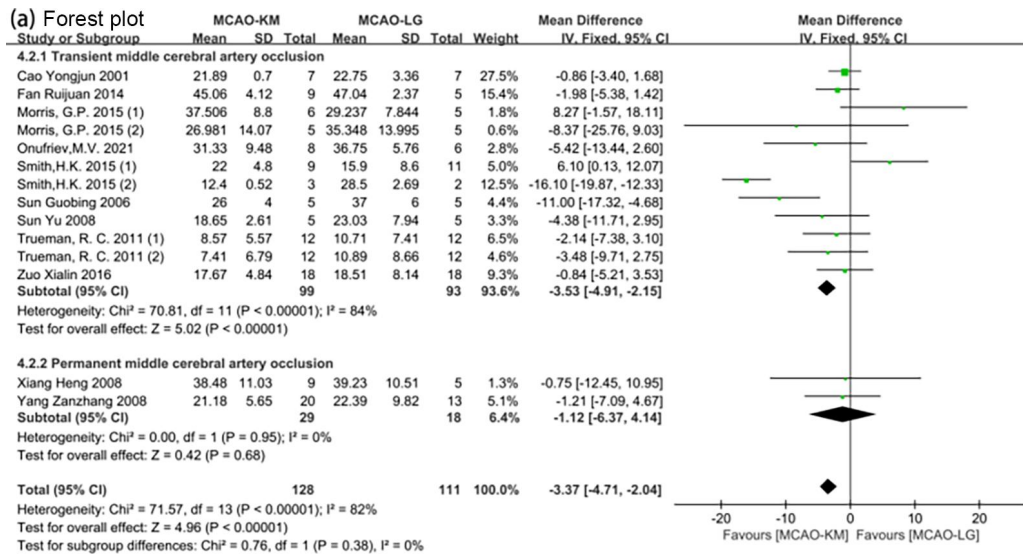
(b) Egger's publication bias plot

(c) Egger's test

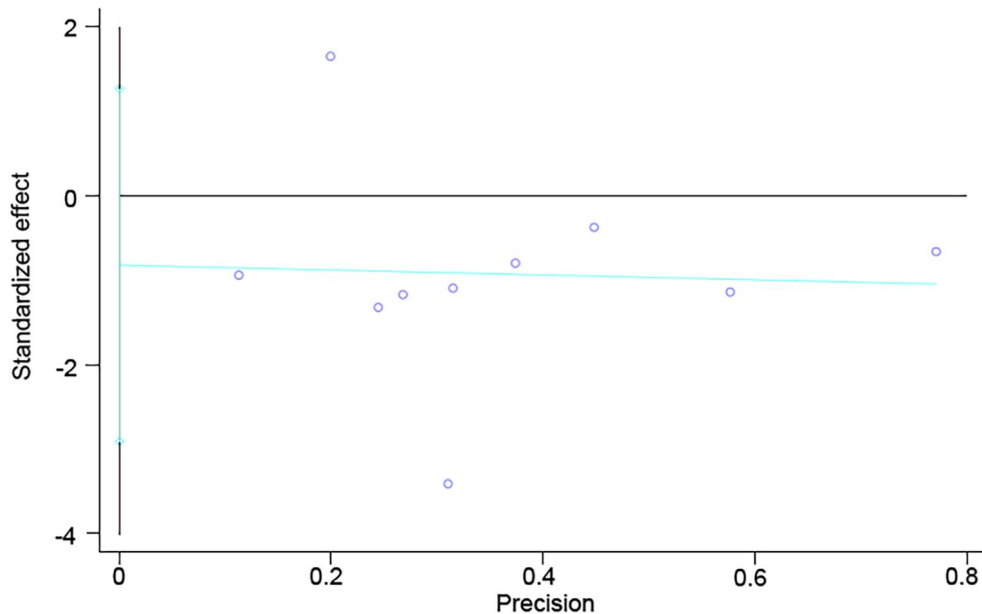| Std_Eff	Coef.	Std. Err.	t	P>|t|	[95% Conf. Interval]	
slope	-.3219122	.1519904	-2.12	0.063	-.6657384	.021914
bias	1.538604	.8084191	1.90	0.089	-.290167	3.367375

Figure 3. Success rates of MCAO model animal between the MCAO-KM and MCAO-LG. (a) Forest plot before sensitivity analysis, (b) Egger's publication bias plot, and (c) Egger's test results.

Study or Subgroup	MCAO-KM Mean	SD	Total	MCAO-LG Mean	SD	Total	Weight	Std. Mean Difference IV, Fixed, 95% CI
Cao Yongjun 2001	68.96	1.88	7	70.98	1.28	7	19.2%	-1.18 [-2.34, -0.01]
Helena Justic 2022	182.22	48.89	8	346.67	13.33	8	6.6%	-4.34 [-6.33, -2.35]
Melissa,T.L. 2017	89.07	100.6	10	140.1	142.5	10	33.2%	-0.40 [-1.28, 0.49]
Morris, G.P. 2015 (1)	41.9	25.2	6	106	41.37	5	11.6%	-1.76 [-3.26, -0.26]
Morris, G.P. 2015 (2)	53.7	28.85	5	110.6	37.79	5	11.5%	-1.53 [-3.04, -0.02]
Smith,H.K. 2015	52.29	45.27	3	93.46	7.93	3	7.4%	-1.01 [-2.89, 0.86]
Yang Zhong 2022	47	10	6	80	16	6	10.4%	-2.28 [-3.87, -0.69]
Total (95% CI)			45			44	100.0%	-1.34 [-1.85, -0.83]

Heterogeneity: Chi² = 14.98, df = 6 (P = 0.02); I² = 60%
Test for overall effect: Z = 5.12 (P < 0.00001)

Figure 4. Forest plot of cerebral blood flow test between the MCAO-KM and the MCAO-LG.

Figure 5. Cerebral infarction rate between the MCAO-KM and the MCAO-LG. Forest plot (a) before sensitivity analysis, Egger's publication bias plot (b), and Egger's test results (c) are shown as follows.
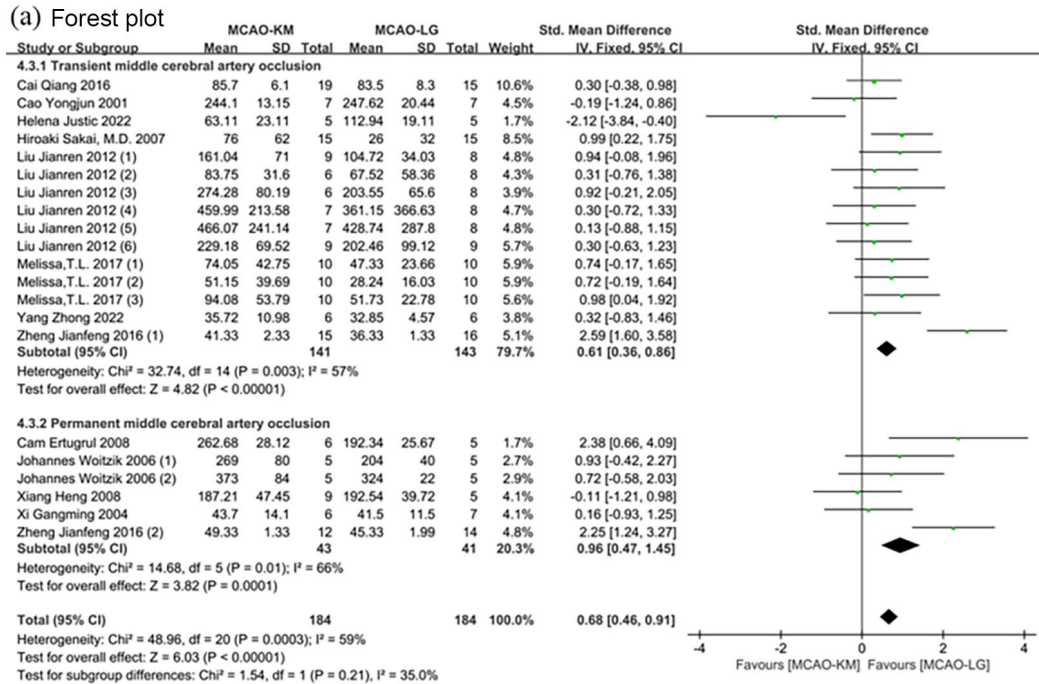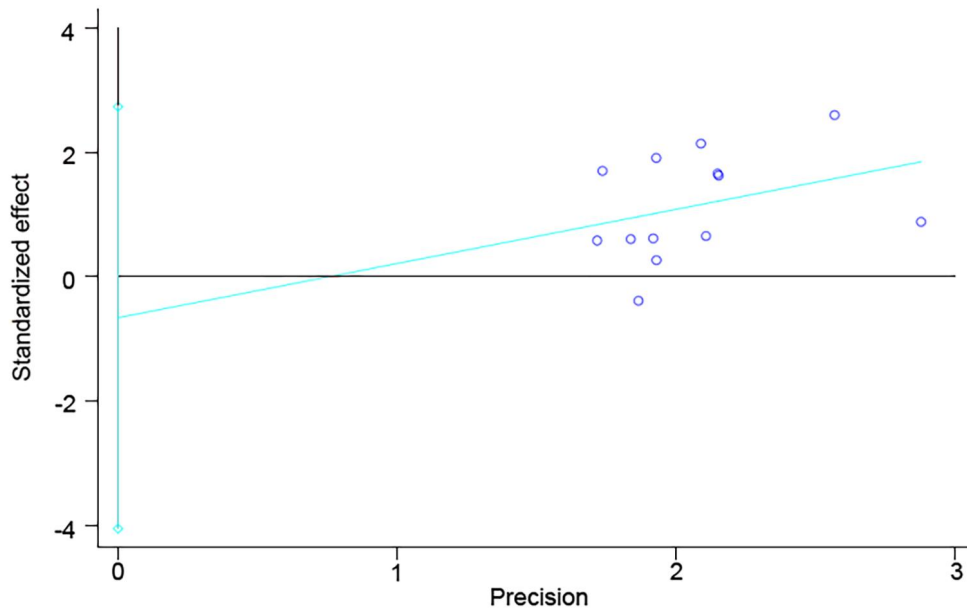
Figure 6. Cerebral infarct volume between the MCAO-KM and the MCAO-LG. Forest plot (a) before sensitivity analysis, Egger's publication bias plot (b), and Egger's test results (c) are shown as follows.
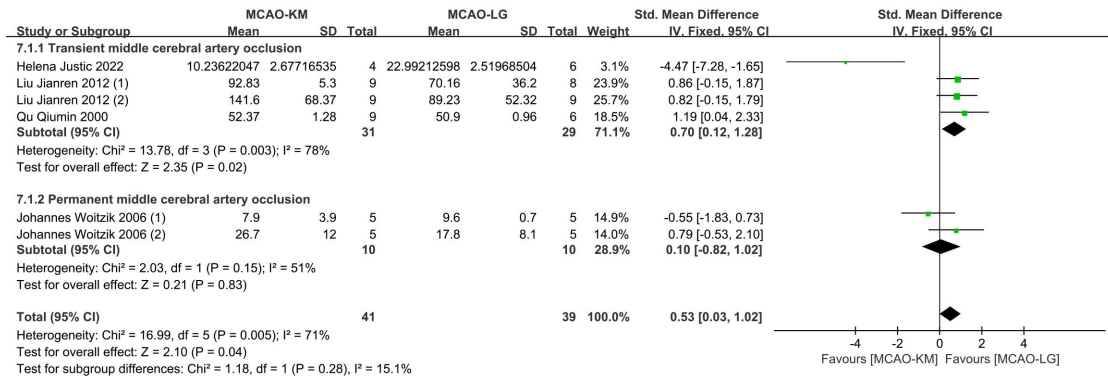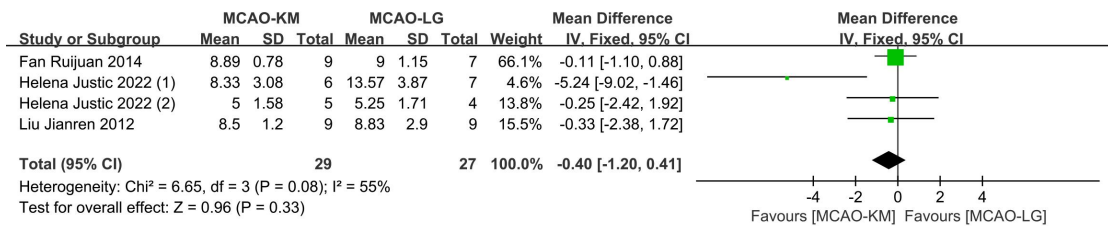
Study or Subgroup	MCAO-KM Mean	SD	Total	MCAO-LG Mean	SD	Total	Weight	Std. Mean Difference IV, Fixed, 95% CI	Std. Mean Difference IV, Fixed, 95% CI
7.1.1 Transient middle cerebral artery occlusion									
Helena Justic 2022	10.23622047	2.67716535	4	22.99212598	2.51968504	6	3.1%	-4.47 [-7.28, -1.65]	
Liu Jianren 2012 (1)	92.83	5.3	9	70.16	36.2	8	23.9%	0.86 [-0.15, 1.87]	
Liu Jianren 2012 (2)	141.6	68.37	9	89.23	52.32	9	25.7%	0.82 [-0.15, 1.79]	
Qu Qiumin 2000	52.37	1.28	9	50.9	0.96	6	18.5%	1.19 [0.04, 2.33]	
Subtotal (95% CI)			31			29	71.1%	0.70 [0.12, 1.28]	
Heterogeneity: Chi² = 13.78, df = 3 (P = 0.003); I² = 78%									
Test for overall effect: Z = 2.35 (P = 0.02)									
7.1.2 Permanent middle cerebral artery occlusion									
Johannes Woitzik 2006 (1)	7.9	3.9	5	9.6	0.7	5	14.9%	-0.55 [-1.83, 0.73]	
Johannes Woitzik 2006 (2)	26.7	12	5	17.8	8.1	5	14.0%	0.79 [-0.53, 2.10]	
Subtotal (95% CI)			10			10	28.9%	0.10 [-0.82, 1.02]	
Heterogeneity: Chi² = 2.03, df = 1 (P = 0.15); I² = 51%									
Test for overall effect: Z = 0.21 (P = 0.83)									
Total (95% CI)			41			39	100.0%	0.53 [0.03, 1.02]	
Heterogeneity: Chi² = 16.99, df = 5 (P = 0.005); I² = 71%									
Test for overall effect: Z = 2.10 (P = 0.04)									
Test for subgroup differences: Chi² = 1.18, df = 1 (P = 0.28), I² = 15.1%									

Favours [MCAO-KM] Favours [MCAO-LG]

Figure 7. Forest plots of brain edema test between the MCAO-KM and the MCAO-LG.

Study or Subgroup	MCAO-KM Mean	SD	Total	MCAO-LG Mean	SD	Total	Weight	Mean Difference IV, Fixed, 95% CI	Mean Difference IV, Fixed, 95% CI
Fan Ruijuan 2014	8.89	0.78	9	9	1.15	7	66.1%	-0.11 [-1.10, 0.88]	
Helena Justic 2022 (1)	8.33	3.08	6	13.57	3.87	7	4.6%	-5.24 [-9.02, -1.46]	
Helena Justic 2022 (2)	5	1.58	5	5.25	1.71	4	13.8%	-0.25 [-2.42, 1.92]	
Liu Jianren 2012	8.5	1.2	9	8.83	2.9	9	15.5%	-0.33 [-2.38, 1.72]	
Total (95% CI)			29			27	100.0%	-0.40 [-1.20, 0.41]	
Heterogeneity: Chi² = 6.65, df = 3 (P = 0.08); I² = 55%									
Test for overall effect: Z = 0.96 (P = 0.33)									

Favours [MCAO-KM] Favours [MCAO-LG]

Figure 8. Garcia scores between the MCAO-KM and the MCAO-LG.