

Online Table I. Procedures performed in control patients

Study	Cardiac catheterization	Bone marrow aspiration	Placebo injection
Ang et al. 2008	No (CABG)	No	No
Assmus et al. 2006	No	No	No
Bartunek et al. 2013	No	No	No
Cao et al. 2009	Yes	No	Yes (Saline + Heparin)
Chen et al. 2004	Yes	No	Yes (Saline)
Colombo et al. 2011	No	No	No
Gao et al. 2013	No	No	No
Ge et al. 2006	Yes	Yes	Yes (bone marrow supernatant)
Grajek et al. 2010	Yes	No	No
Hendriks et al. 2006	Yes	No	Yes (Saline + Heparin)
Hirsch et al. 2011	No	No	No
Huang et al. 2006	No	No	No
Huikuri et al. 2008	Yes	No	Yes (Saline)
Janssens et al. 2006	Yes	Yes	Yes (Saline + Serum)
Jazi et al. 2012	Yes	No	No
Lipiec et al. 2009	No	No	No
Lu et al. 2013	Yes	Yes	Yes (Saline + Serum)
Lunde et al. 2006	No	No	No
Maureira et al. 2012	No (CABG)	No	No
Meluzin et al. 2006	No	No	No
Meyer et al. 2006	No	No	No
Nogueira et al. 2009	No	No	No
Penicka et al. 2007	No	No	No
Perin et al. 2011	Yes	No	No
Perin et al. AHJ 2012	Yes	Yes	Yes (Saline + 5% Albumin)
Perin et al. JAMA 2012	Yes	Yes	Yes (Cell free suspension)
Piepoli et al. 2013	No	No	No
Plewka et al. 2011	No	No	No
Pokushalov et al. 2010	No	No	No
Quyumi et al. 2011	No	No	No
Ramshorst et al. 2009	Yes	Yes	Yes (Saline + 5% Albumin)
Roncalli et al. 2011	No	No	No
Ruan et al. 2005	Yes	No	Yes (Diluted Serum)
Schachinger et al. 2006	Yes	Yes	Yes (Serum + Cambrex)
Silva et al. 2009	No	No	No
Srimahachota et al. 2011	No	No	No
Suarez de Lezo et al. 2007	No	No	No
Surder et al. 2013	No	No	No

Traverse et al. 2010	Yes	Yes	Yes (Saline + Albumin)
Traverse et al. 2011	Yes	Yes	Yes (Saline + Albumin + RBCs)
Traverse et al. 2014	Yes	Yes	Yes (Saline + Albumin + RBCs)
Tse et al. 2007	Yes	Yes	Yes (Autologous plasma)
Turan et al. 2012	No	No	No
Turan et al. 2011 (Stem Cell Review)	No	No	No
Wohrle et al. 2013	Yes	Yes	Yes (Saline + Albumin + RBCs)
Yao et al. 2008	Yes	No	Yes (Saline + Heparin)
Yao et al. 2009	Yes	No	Yes (Saline + Heparin)
Zhao et al. 2008	Yes	No	Yes (Saline + Heparin)

Abbreviations: CABG, coronary artery bypass graft surgery; RBC, red blood cell

Online Table II. Trials with Discrepancies in Reporting Outcomes/Results

Source	Total Number of Discrepancies in Results
Colombo et al. 2011	6
Huikuri et al. 2008	13
Lunde et al. 2006	4
Meyer et al. 2006	5
Srimahachota et al. 2011	5
Traverse et al. 2010	5
Zhao et al. 2008	38

Online Table III. Quality assessment scale for studies included in meta-analysis

	Selection			Performance	Detection	Attrition	
	Was allocation adequate?*	Was an adequate method of randomization described?	Were groups similar at the start of the study?			Were the patients/caregivers blinded to the intervention?	Was the outcome ascertained blindly?
Ang et al. 2008	Y	N	Y	Y	Y	8%	N
Assmus et al. 2006	Y	N	Y	N	Y	8.60 %	Y
Bartunek et al. 2013	Y	N	Y	N	Y	0	Y
Cao et al. 2009	Y	Y	Y	NR	Y	0	Y
Chen et al. 2004	Y	N	Y	Y	Y	0	Y
Colombo et al. 2011	Y	Y	Y	Y	Y	0	Y
Gao et al. 2013	N	Y	N	N	Y	2.30 %	Y
Ge et al. 2006	Y	Y	Y	N	Y	0	Y
Grajek et al. 2010	Y	Y	Y	N	Y	0	Y
Hendrikkx et al. 2006	Y	Y	Y	Y	Y	1%	Y
Hirsch et al. 2011	Y	Y	Y	N	Y	0	Y
Huang et al. 2006	Y	Y	Y	Y	Y	3.70 %	Y
Huikuri et al. 2008	Y	Y	Y	N	Y	0	Y
Janssens et al. 2006	Y	Y	Y	Y	Y	10 %	Y
Jazi et al. 2012	Y	Y	Y	N	NR	0	Y
Lipiec et al. 2009	Y	Y	Y	N	Y	5 %	N
Lu et al. 2013	Y	N	Y	Y	Y	6 %	Y
Lunde et al. 2006	Y	N	Y	NR	Y	9 %	N
Maureira et al. 2012	Y	N	Y	N	NR	0	Y
Meluzin et al. 2006	Y	Y	Y	Y	Y	0	Y
Meyer et al. 2006	Y	Y	NR	NR	NR	11 %	N
Nogueira et al. 2009	Y	Y	Y	NR	NR	0	Y
Penicka et al. 2007	Y	N	Y	NR	Y	0	Y
Perin et al. 2011	Y	Y	Y	Y	Y	0	Y
Perin et al. AHJ 2012	Y	Y	Y	Y	Y	5	Y
Perin et al. JAMA 2012	Y	Y	Y	Y	Y	4.30 %	Y
Piepoli et al. 2013	Y	Y	Y	N	Y	0	Y

Plewka et al. 2011	Y	Y	Y	N	Y	0	N
Pokushalov et al. 2010	Y	Y	Y	Y	Y	18 %	Y
Quyumi et al. 2011	Y	N	Y	Y	Y	0	Y
Ramshorst et al. 2009	Y	Y	Y	NR	Y	0	Y
Roncalli et al. 2011	Y	Y	Y	N	Y	0	Y
Ruan et al. 2005	Y	Y	Y	Y	Y	0	Y
Schachinger et al. 2006	Y	Y	Y	N	Y	0	Y
Silva et al. 2009	N	Y	Y	N	Y	0	Y
Srimahachota et al. 2011	Y	Y	Y	Y	Y	0	Y
Suarez de Lezo et al. 2007	Y	Y	Y	Y	Y	7 %	Y
Surder et al. 2013	Y	Y	Y	N	Y	11.50 %	Y
Traverse et al. 2010	Y	Y	Y	Y	Y	4.70 %	Y
Traverse et al. 2011	Y	Y	Y	Y	Y	0	Y
Traverse et al. 2014	Y	Y	Y	Y	Y	10.70 %	Y
Tse et al. 2007	Y	Y	Y	NR	Y	13 %	N
Turan et al. 2012	Y	Y	Y	N	Y	5.50 %	Y
Turan et al. 2011 (Stem Cell Review)	Y	Y	Y	N	Y	0	Y
Wohrle et al. 2013	Y	Y	Y	Y	Y	NA	Y
Yao et al. 2008	Y	Y	Y	N	Y	0	N
Yao et al. 2009	Y	Y	Y	N	Y	0	Y
Zhao et al. 2008	Y	N	Y	N	Y	0	y

N, No; NA, not available; NR, not reported; Y, Yes

*'Adequate' means the use of a central site, numeric codes, opaque envelopes, drugs prepared by pharmacy, and other appropriate procedures as described by Juni et al.

Online Figure I. Search results from PubMed.

Online Figure II. Impact of BMC transplantation on LV ejection fraction. Forest plot of unadjusted difference in mean (with 95% confidence intervals [CIs]) change in left ventricular ejection fraction (LVEF) in patients treated with bone marrow cells (BMCs) compared with controls in RCTs after excluding studies with discrepant reporting of outcomes of interest. Transplantation of BMCs resulted in a 2.90% (95% CI, 1.83–3.97; $P < 0.00001$) increase in mean LVEF. The overall effect was statistically significant in favor of BMC transplantation. IV, inverse variance.

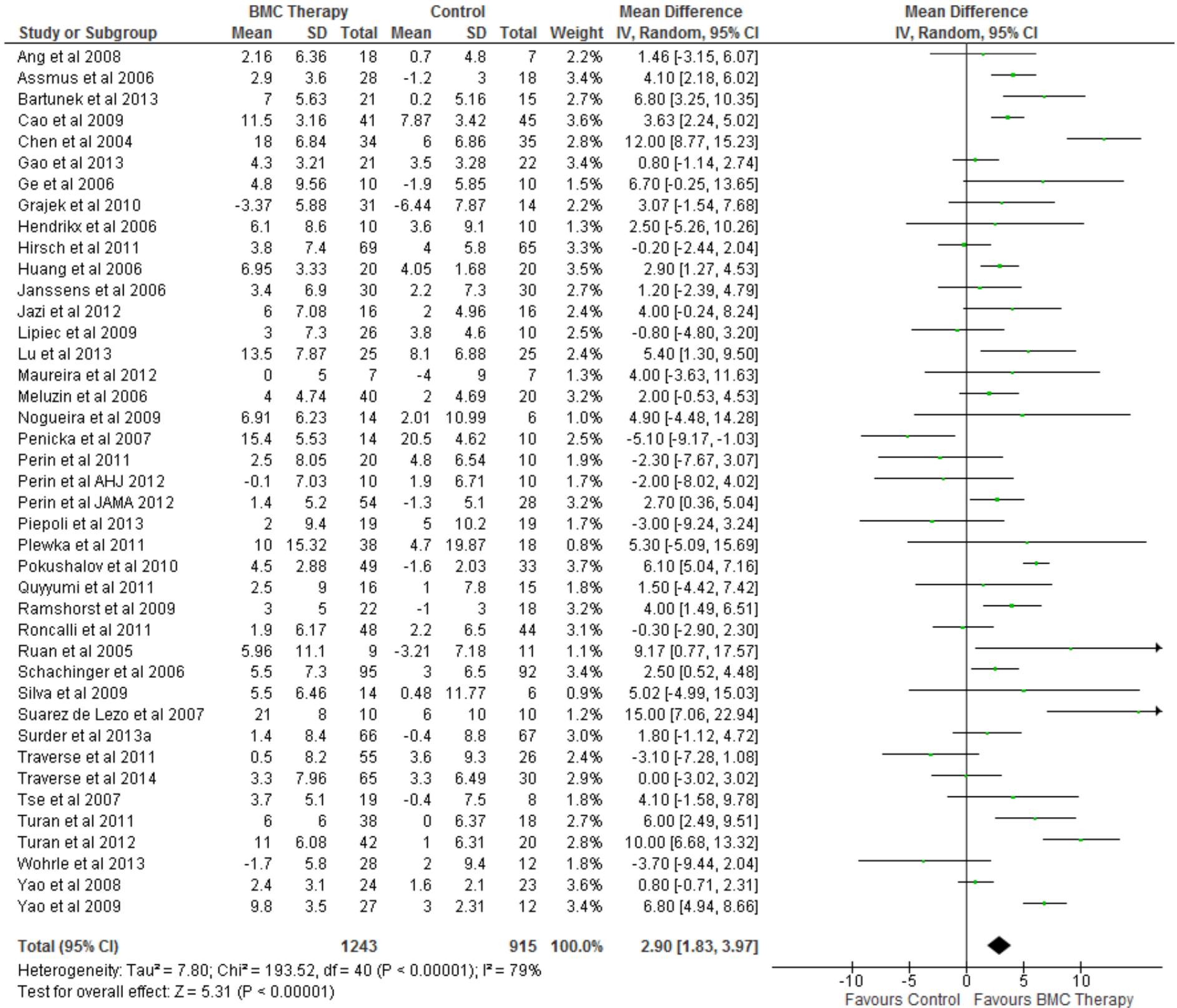
Online Figure III. Impact of BMC transplantation on infarct size. Forest plot of unadjusted difference in mean (with 95% confidence intervals [CIs]) change in infarct scar size in patients treated with bone marrow cells (BMCs) compared with controls in included RCTs after excluding studies with discrepant reporting of outcomes of interest. Transplantation of BMCs resulted in a 2.21% (95% CI, -3.61 to -0.82; $P < 0.002$) decrease in mean infarct scar size. The overall effect was statistically significant in favor of BMC transplantation. IV, inverse variance.

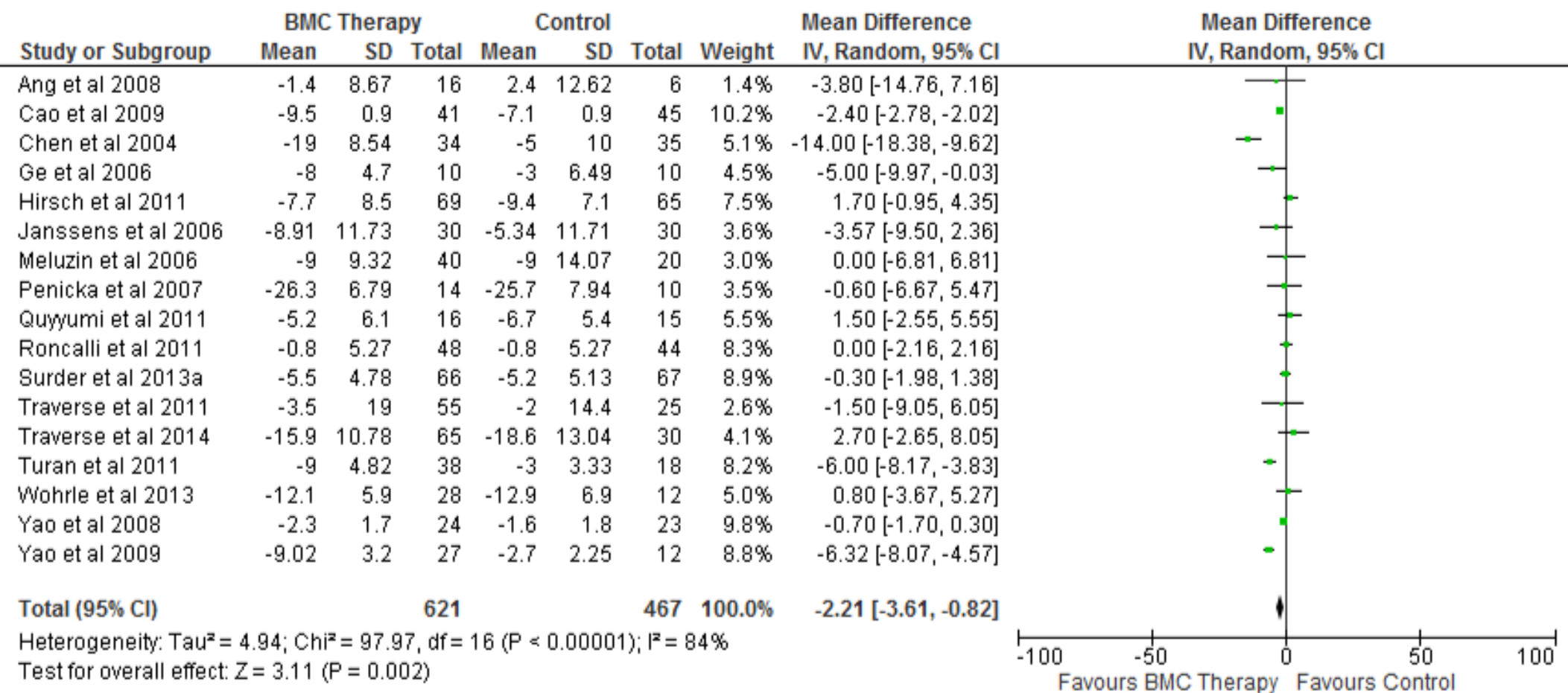
Online Figure IV. Impact of BMC transplantation on LVESV. Forest plot of unadjusted difference in mean (with 95% confidence intervals [CIs]) change in left ventricular end-systolic volume (LVESV) in patients treated with bone marrow cells (BMCs) compared with controls in included RCTs after excluding studies with discrepant reporting of outcomes of interest. Transplantation of BMCs resulted in 7.14 ml (95% CI, -10.14 to -4.15; $P < 0.00001$) decrease in LVESV. The overall effect was statistically significant in favor of BMC transplantation. IV, inverse variance.

Online Figure V. Impact of BMC transplantation on LVEDV. Forest plot of unadjusted difference in mean (with 95% confidence intervals [CIs]) change in left ventricular end-diastolic volume (LVEDV) in patients treated with bone marrow cells (BMCs) compared with controls in included RCTs after excluding studies with discrepant reporting of outcomes of interest. BMC transplantation resulted in a 1.52 ml (95% CI, -3.78 to 0.74; $P = 0.19$) decrease in mean LVEDV. The overall effect was not significant statistically. IV, inverse variance.

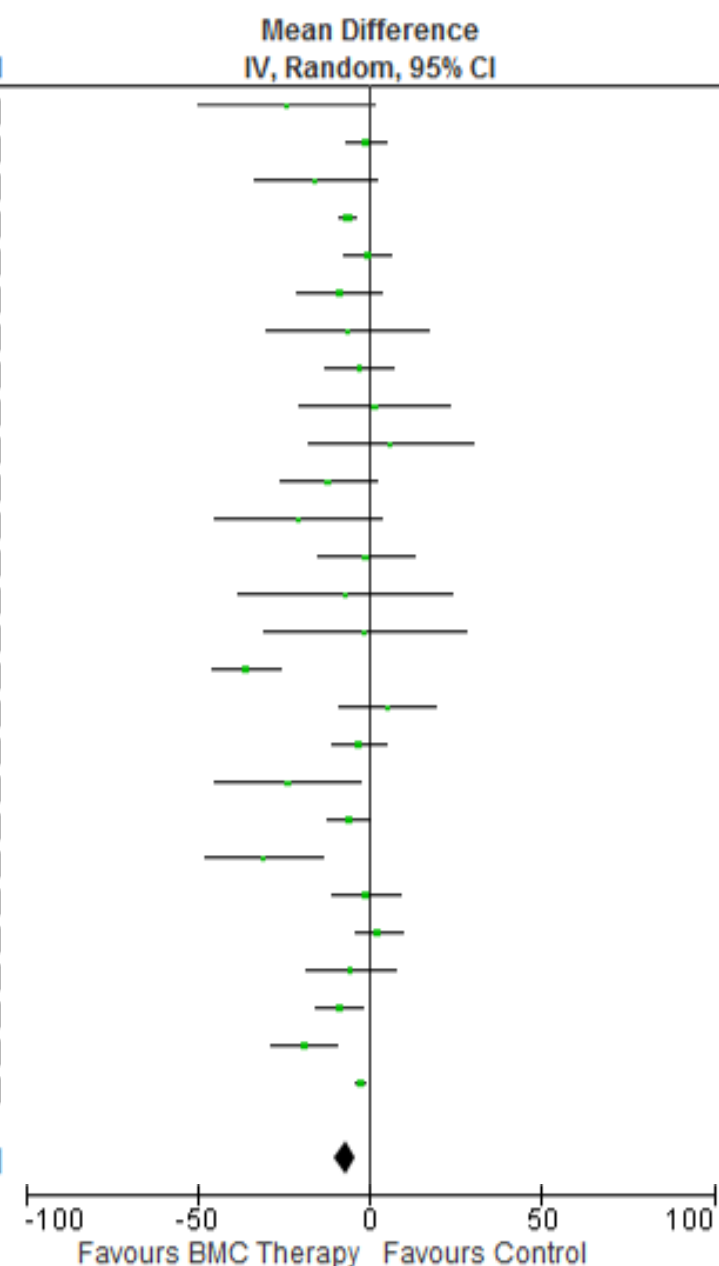
Online Figure I. Search results from PubMed

Search	Add to builder	Query	Items found	Time
#17	Add	Search #7 AND #15 Limits: Humans, All Adult: 19 + years	2498	18:09:35
#16	Add	Search #7 AND #15	8289	18:07:26
#15	Add	Search #8 OR #9 OR #10 OR #11 OR #12 OR #13 OR #14	506545	18:06:39
#14	Add	Search heart failure	176137	18:06:17
#13	Add	Search chronic ischemic heart disease	28811	18:06:03
#12	Add	Search ischemic cardiomyopathy	16655	18:05:21
#11	Add	Search cardiomyopathy	92317	18:05:08
#10	Add	Search coronary artery disease	123633	18:04:16
#9	Add	Search acute myocardial infarction	74210	18:03:59
#8	Add	Search myocardial infarction	198546	18:03:46
#7	Add	Search #1 OR #2 OR #3 OR #4 OR #5 OR #6	437077	18:02:18
#6	Add	Search progenitor cells	224760	18:01:30
#5	Add	Search progenitor cell	224228	18:01:19
#4	Add	Search stem cells	212854	18:01:04
#3	Add	Search stem cell	257595	18:00:53
#2	Add	Search bone marrow cells	223445	18:00:42
#1	Add	Search bone marrow cell	250800	18:00:34

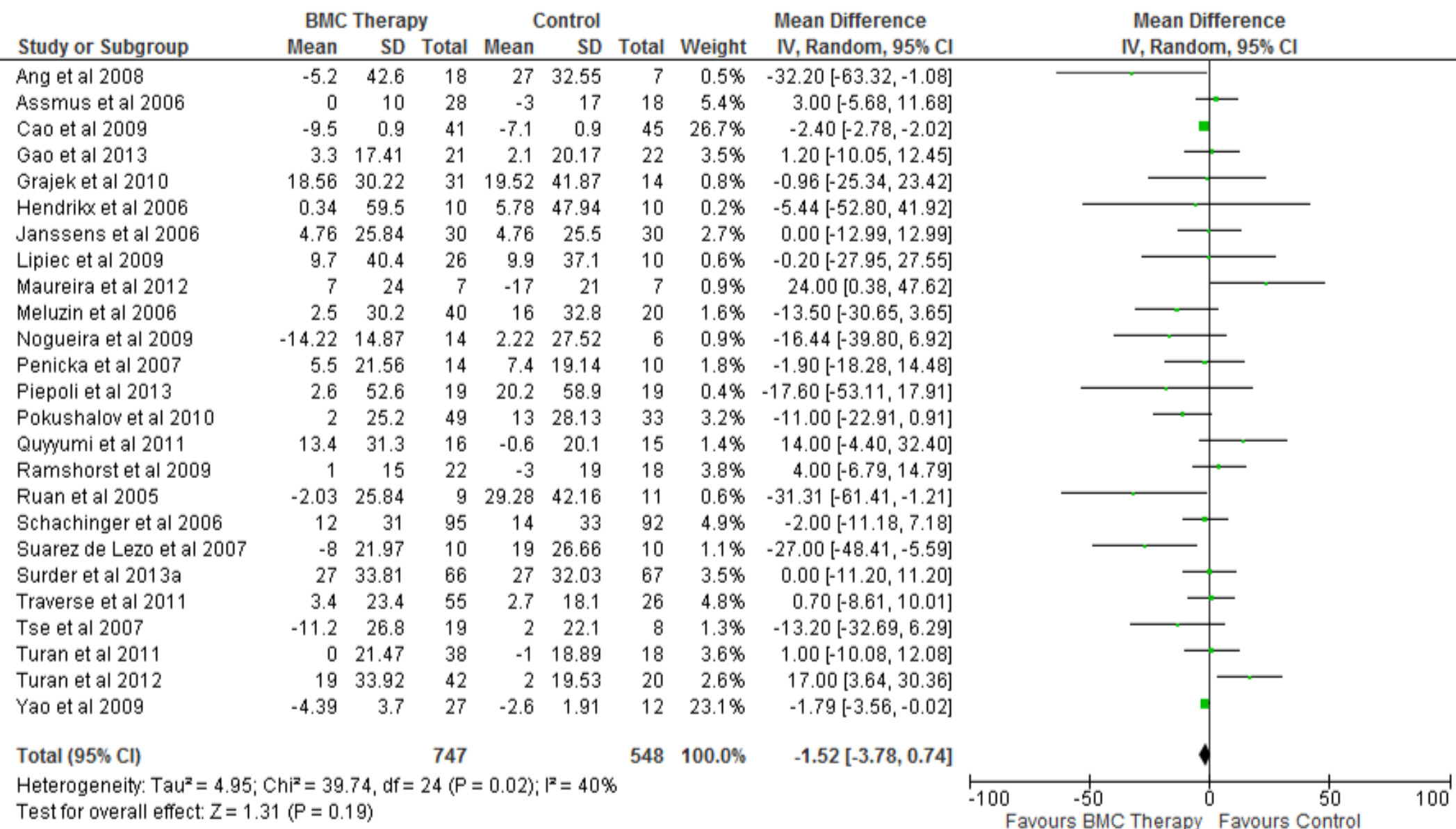




Study or Subgroup	BMC Therapy			Control			Weight	Mean Difference IV, Random, 95% CI
	Mean	SD	Total	Mean	SD	Total		
Ang et al 2008	-6.3	36.9	18	17.9	25.27	7	1.2%	-24.20 [-49.52, 1.12]
Assmus et al 2006	-2	5	28	-1	12	18	6.4%	-1.00 [-6.84, 4.84]
Bartunek et al 2013	-24.8	25.92	21	-8.8	27.45	15	2.1%	-16.00 [-33.77, 1.77]
Cao et al 2009	-13.2	5.02	41	-6.9	6.49	45	8.0%	-6.30 [-8.74, -3.86]
Gao et al 2013	-4.1	11	21	-3.6	11.73	22	5.9%	-0.50 [-7.29, 6.29]
Grajek et al 2010	10.12	11.83	31	19.01	21.56	14	3.6%	-8.89 [-20.93, 3.15]
Hendriks et al 2006	-8.67	29.24	10	-2.21	23.97	10	1.4%	-6.46 [-29.89, 16.97]
Janssens et al 2006	-1.87	19.04	30	1.02	19.72	30	4.4%	-2.89 [-12.70, 6.92]
Lipiec et al 2009	5	34.3	26	3.4	28	10	1.5%	1.60 [-20.19, 23.39]
Maureira et al 2012	4	20	7	-2	25	7	1.3%	6.00 [-17.72, 29.72]
Meluzin et al 2006	-6	21.2	40	6	28.14	20	3.0%	-12.00 [-25.97, 1.97]
Nogueira et al 2009	-12.76	8.02	14	8.14	29.82	6	1.3%	-20.90 [-45.13, 3.33]
Penicka et al 2007	-3.1	15.72	14	-2	18.28	10	3.0%	-1.10 [-15.11, 12.91]
Perin et al AHJ 2012	-7.3	26.91	10	-0.2	42.32	10	0.8%	-7.10 [-38.18, 23.98]
Piepoli et al 2013	2.6	33.9	19	4	55.8	19	0.9%	-1.40 [-30.76, 27.96]
Pokushalov et al 2010	-33	25.28	49	3	20.91	33	4.3%	-36.00 [-46.05, -25.95]
Quyumi et al 2011	3.4	22.1	16	-1.84	17.1	15	3.0%	5.24 [-8.62, 19.10]
Ramshorst et al 2009	-4	15	22	-1	10	18	5.4%	-3.00 [-10.79, 4.79]
Ruan et al 2005	-4.69	21.88	9	19.1	26.46	11	1.6%	-23.79 [-44.98, -2.60]
Schachinger et al 2006	-0.6	19	95	5.6	22	92	6.4%	-6.20 [-12.10, -0.30]
Suarez de Lezo et al 2007	-27	15.44	10	4	22.8	10	2.3%	-31.00 [-48.07, -13.93]
Surder et al 2013a	17	29.14	66	18	29.96	67	4.3%	-1.00 [-11.04, 9.04]
Traverse et al 2011	0.2	14	55	-2.3	14.7	26	5.9%	2.50 [-4.25, 9.25]
Tse et al 2007	-8.8	18.4	19	-3.1	14.4	8	3.3%	-5.70 [-18.66, 7.26]
Turan et al 2011	-9	12.96	38	0	11.47	18	5.9%	-9.00 [-15.71, -2.29]
Turan et al 2012	-21	13.15	42	-2	19.49	20	4.6%	-19.00 [-28.42, -9.58]
Yao et al 2009	-7.26	2.07	27	-4.5	2.25	12	8.3%	-2.76 [-4.25, -1.27]
Total (95% CI)			778			573	100.0%	-7.14 [-10.14, -4.15]



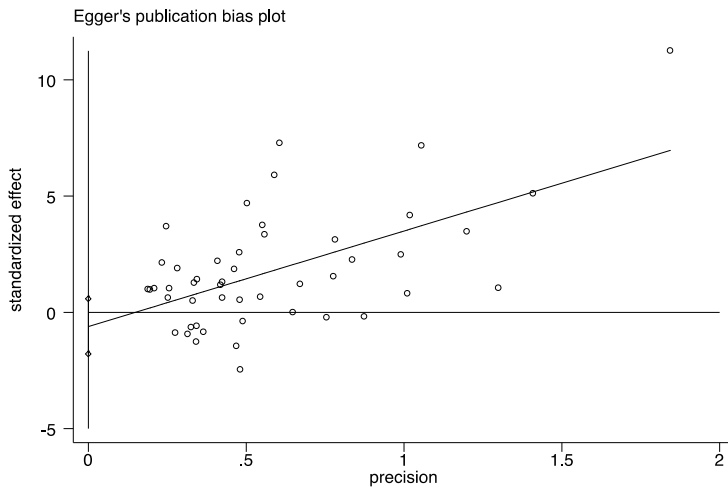
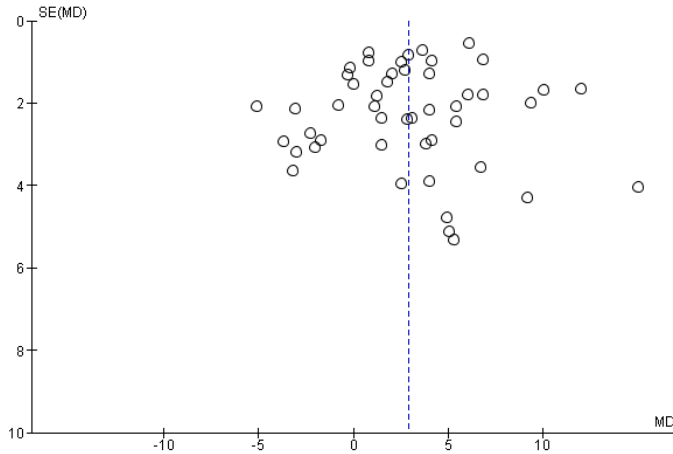
Heterogeneity: $\tau^2 = 27.73$; $\chi^2 = 86.78$, $df = 26$ ($P < 0.00001$); $I^2 = 70\%$
 Test for overall effect: $Z = 4.67$ ($P < 0.00001$)



Online Figure VI (A-D).

(6A) Funnel Plot for the assessment of publication bias for LVEF.

The upper panel shows the funnel plot using the effect size on the X-axis and standard error (SE) on the Y-axis. The lower panel shows Egger's publication bias plot using standardized effect on the Y-axis and precision on the X-axis. The funnel plot and Egger's test did not show any evidence of publication Bias.

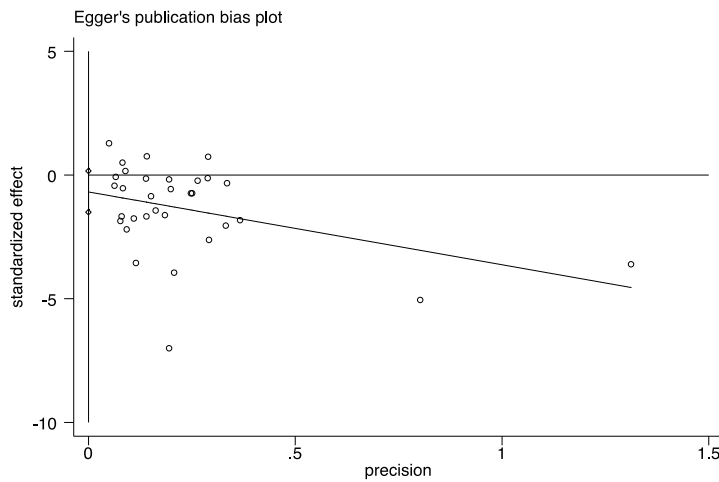
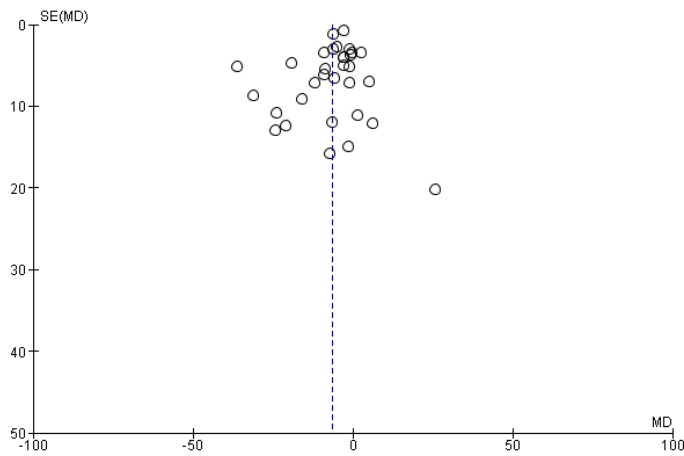


Egger's test

Std_Eff	Coef.	Std. Err.	t	P> t	[95% Conf. Interval]	
slope	4.10966	.8680184	4.73	0.000	2.36243	5.85689
bias	-.6120863	.5898122	-1.04	0.305	-1.799317	.5751441

(6B) Funnel Plot for the assessment of publication bias for LVESV.

The upper panel shows the funnel plot using the effect size on the X-axis and standard error (SE) on the Y-axis. The lower panel shows Egger's publication bias plot using standardized effect on the Y-axis and precision on the X-axis. The funnel plot and Egger's test did not show any evidence of publication Bias.

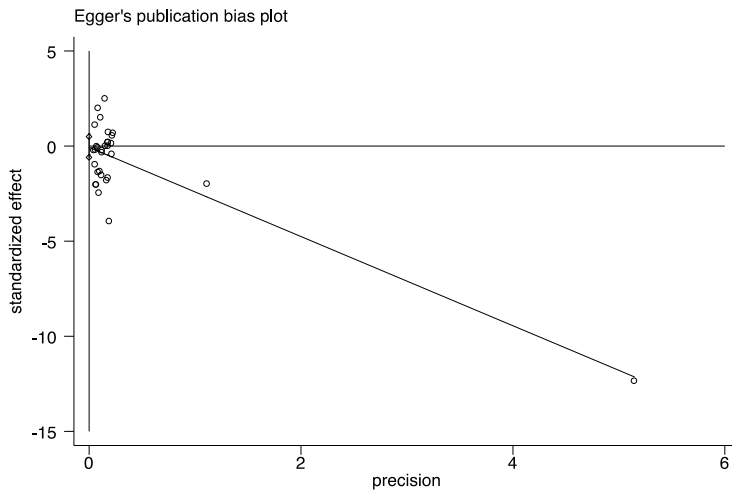
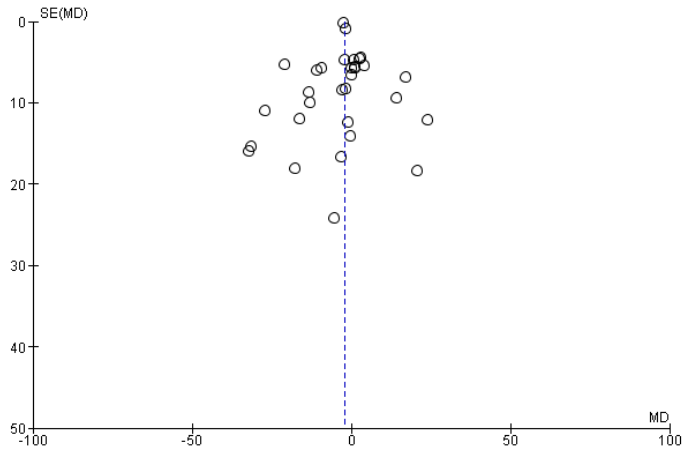


Egger's test

Std_Eff	Coef.	Std. Err.	t	P> t	[95% Conf. Interval]	
slope	-2.945084	1.22748	-2.40	0.023	-5.451931	-.4382356
bias	-.6841486	.4090674	-1.67	0.105	-1.519576	.1512784

(6C) Funnel Plot for the assessment of publication bias for LVEDV.

The upper panel shows the funnel plot using the effect size on the X-axis and standard error (SE) on the Y-axis. The lower panel shows Egger's publication bias plot using standardized effect on the Y-axis and precision on the X-axis. The funnel plot and Egger's test did not show any evidence of publication Bias.

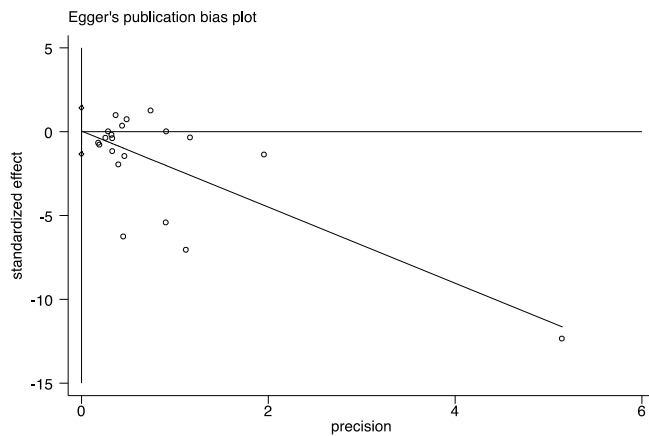
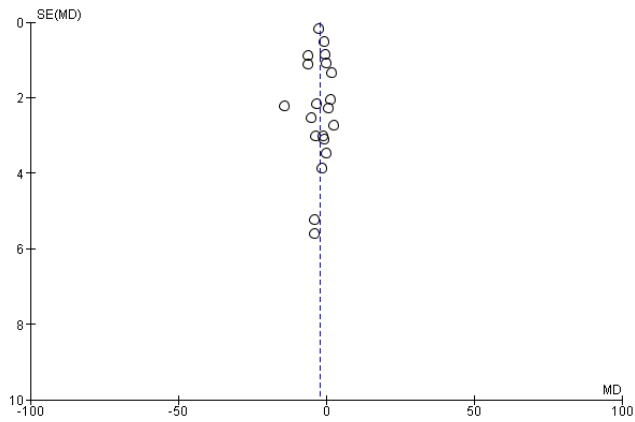


Egger's test

Std_Eff	Coef.	Std. Err.	t	P> t	[95% Conf. Interval]	
slope	-2.345465	.2778366	-8.44	0.000	-2.913705	-1.777225
bias	-.0665326	.265396	-0.25	0.804	-.6093284	.4762631

(6D) Funnel Plot for the assessment of publication bias for Infarct Size.

The upper panel shows the funnel plot using the effect size on the X-axis and standard error (SE) on the Y-axis. The lower panel shows Egger's publication bias plot using standardized effect on the Y-axis and precision on the X-axis. The funnel plot and Egger's test did not show any evidence of publication Bias.



Egger's test

Std_Eff	Coef.	Std. Err.	t	P> t	[95% Conf. Interval]	
slope	-2.268879	.4845653	-4.68	0.000	-3.286913	-1.250845
bias	.0364451	.6570608	0.06	0.956	-1.343988	1.416879