

Supplementary Table S1: Search strategy

Database: Pubmed/ MEDLINE

((IVF) OR (ICSI) OR (Vitrification) OR (Cryopreservation)) AND ((Blastocyst formation) OR (Cleavage rate))) (n=5.154)

Query	Search Details	Results
((IVF) OR (ICSI) OR (Vitrification) OR (Cryopreservation)) AND ((Blastocyst formation) OR (Cleavage rate)))	("in vitro fert embryo transf"[Journal] OR "ivf"[All Fields] OR ("sperm injections, intracytoplasmic"[MeSH Terms] OR ("sperm"[All Fields] AND "injections"[All Fields] AND "intracytoplasmic"[All Fields]) OR "intracytoplasmic sperm injections"[All Fields] OR "icsi"[All Fields]) OR ("vitrificated"[All Fields] OR "vitrification"[MeSH Terms] OR "vitrification"[All Fields]) OR ("cryopreservability"[All Fields] OR "cryopreservable"[All Fields] OR "cryopreservant"[All Fields] OR "cryopreservants"[All Fields] OR "cryopreserved"[All Fields] OR "cryopreservation"[MeSH Terms] OR "cryopreservation"[All Fields] OR "cryopreserved"[All Fields] OR "cryopreservations"[All Fields] OR "cryopreservative"[All Fields] OR "cryopreservatives"[All Fields] OR "cryopreserve"[All Fields] OR "cryopreserving"[All Fields])) AND (((("blastocyst"[MeSH Terms] OR "blastocyst"[All Fields] OR "blastocysts"[All Fields]) AND ("formations"[All Fields] OR "metabolism"[MeSH Terms] OR "metabolism"[All Fields] OR "formation"[All Fields])) OR (("cleavaged"[All Fields] OR "cleavages"[All Fields] OR "cytokinesis"[MeSH Terms] OR "cytokinesis"[All Fields] OR "cleavage"[All Fields]) AND ("rehab assist technol eng"[Journal] OR "rate"[All Fields]))))	5.154

Database: Cochrane Library

((IVF) OR (ICSI) OR (Vitrification) OR (Cryopreservation)) AND ((Blastocyst formation) OR (Cleavage rate))) (n=365)

Supplementary Table S2: Treatment effect and standard error per study for the fertilization rate per oocyte retrieved outcome.

AUTHOR	YEAR	Treatment Effect	Standard Error of Treatment Effect	Group 1	Group 2	2PN zygotes group 1	MII oocytes retrieved group 1	2PN zygotes group 2	MII oocytes retrieved group 2
De Munck	2016	0.050271	0.05619	OPE N	CL OSE	188	257	176	253

Rienzi	2010	-0.08408	0.064253	OPE N	FRE SH	95	124	100	120
Porcu	2021	0.062181	0.049353	OPE N	CL OSE	445	1095	561	1469
Gullo	2020	-0.01934	0.028391	OPE N	CL OSE	594	790	601	784
Cobo	2010	-0.06521	0.015919	OPE N	FRE SH	2256	3286	2334	3185
Sole	2013	-0.18361	0.026667	OPE N	FRE SH	665	990	887	1099
Pujol	2019	0.138261	0.054782	OPE N	CL OSE	294	474	269	498
Buderat ska	2020	0.013032	0.048061	OPE N	FRE SH	102	121	218	262
De Ghesell e	2020	-0.25328	0.067449	OPE N	FRE SH	160	287	158	220
Cobo	2008	-0.10464	0.050083	OPE N	FRE SH	171	231	180	219
Paffoni a	2011	-0.56498	0.085429	OPE N	FRE SH	116	268	99	130
Paffoni b	2011	-0.85678	0.098435	CL OSE	FRE SH	87	261	106	135
Papathe odorou	2013	-0.02395	0.039888	OPE N	CL OSE	406	608	409	598
Garcia	2011	-0.258	0.043703	CL OSE	FRE SH	191	283	608	696
Trokoud es	2011	-0.1161	0.045114	OPE N	FRE SH	162	210	214	247
Chamay ou	2017	-0.10303	0.039531	OPE N	FRE SH	411	615	343	463
Papathe odorou	2016	-0.06959	0.023786	CL OSE	FRE SH	744	984	796	982
Gallard o	2016	0.004454	0.097086	CL OSE	FRE SH	51	68	56	75
Parmegi ani	2011	-0.32708	0.067038	OPE N	FRE SH	107	168	106	120
Forman	2012	-0.35239	0.048003	OPE N	FRE SH	187	294	266	294
Chang	2013	-0.11778	0.065743	OPE N	FRE SH	124	186	153	204
Antinori	2007	-0.04516	0.017189	OPE N	FRE SH	305	330	702	726
Montjea n D	2015	-0.11352	0.045973	OPE N	FRE SH	376	648	351	540
Ubaldi	2010	-0.3733	0.033769	OPE N	FRE SH	462	770	468	537

Supplementary Table S3: Treatment effect and standard error per study for the cleavage rate per oocyte retrieved outcome.

AUTHOR	YEAR	Treatment Effect	Standard Error of Treatment Effect	Group 1	Group 2	Cleaved embryos group 1	MII oocytes retrieved group 1	Cleaved embryos group 2	MII oocytes retrieved group 1
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De Munck	2016	0.112489	0.090676	OPEN	CLOSE	133	257	117	253
Rienzi	2010	-0.10536	0.065991	OPEN	FRESH	93	124	100	120
Porcu	2021	0.059798	0.053498	OPEN	CLOSE	402	1095	508	1469
Gullo	2020	-0.01659	0.032345	OPEN	CLOSE	555	790	560	784
Cobo	2010	-0.08262	0.020507	OPEN	FRESH	1877	3286	1976	3185
Sole	2013	-0.22317	0.043243	OPEN	FRESH	454	990	630	1099
Pujol	2019	0.049393	0.107844	OPEN	CLOSE	127	474	127	498
Buderat ska	2020	0.02009	0.06531	OPEN	FRESH	90	121	191	262
De Ghesell e	2020	-0.25328	0.067449	OPEN	FRESH	160	287	158	220
Cobo	2008	-0.22898	0.076264	OPEN	FRESH	125	231	149	219
Paffoni a	2011	-0.57966	0.088398	OPEN	FRESH	112	268	97	130
Paffoni b	2011	-1.04026	0.114695	CLOSE	FRESH	69	261	101	135
Papath eodoro u	2013	-0.03493	0.043885	OPEN	CLOSE	378	608	385	598
Garcia	2011	-0.2754	0.046285	CLOSE	FRESH	184	283	596	696
Trokou des	2011	-0.1173	0.050191	OPEN	FRESH	155	210	205	247
Papath eodoro u	2016	-0.06775	0.027635	CLOSE	FRESH	692	984	739	982
Gallard o	2016	0.030539	0.130214	CLOSE	FRESH	43	68	46	75
Parmeg iani	2011	-0.34954	0.1089	OPEN	FRESH	76	168	77	120
Forman	2012	-0.44015	0.053549	OPEN	FRESH	170	294	264	294
Antinori	2007	-0.05399	0.021023	OPEN	FRESH	295	330	685	726
Montje an D	2015	-0.35042	0.05348	OPEN	FRESH	295	648	349	540

Supplementary Table S4: Treatment effect and standard error per study for the cleavage rate per 2PN zygote outcome.

AUTHOR	YE AR	Treatment Effect	Standard Error of Treatment Effect	Grou p 1	Grou p 2	Cleaved embryos group 1	2PN zygotes group 1	Cleaved embryos group 2	2PN zygotes group 2
De Munck	20 16	0.062217	0.071168	OPE N	CLO SE	133	188	117	176
Rienzi	20 10	-0.02116	0.014966	OPE N	FRE SH	93	95	100	100
Porcu	20 21	-0.00238	0.020648	OPE N	CLO SE	402	445	508	561
Gullo	20 20	0.002747	0.015496	OPE N	CLO SE	555	594	560	601
Cobo	20 10	-0.01741	0.012928	OPE N	FRE SH	1877	2256	1976	2334
Sole	20 13	-0.03956	0.034041	OPE N	FRE SH	454	665	630	887
Pujol	20 19	-0.08887	0.092893	OPE N	CLO SE	127	294	127	269
Buderats ka	20 20	0.007058	0.044223	OPE N	FRE SH	90	102	191	218
De Gheselle	20 20	0	0.00628	OPE N	FRE SH	160	160	158	158
Cobo	20 08	-0.12434	0.057514	OPE N	FRE SH	125	171	149	180
Paffoni a	20 11	-0.01468	0.022719	OPE N	FRE SH	112	116	97	99
Paffoni b	20 11	-0.18348	0.058869	CLO SE	FRE SH	69	87	101	106
Papatheo dorou	20 13	-0.01099	0.018299	OPE N	CLO SE	378	406	385	409
Garcia	20 11	-0.0174	0.015241	CLO SE	FRE SH	184	191	596	608
Trokoude s	20 11	-0.00121	0.021998	OPE N	FRE SH	155	162	205	214
Papatheo dorou	20 16	0.001846	0.014068	CLO SE	FRE SH	692	744	739	796
Gallardo	20 16	0.026085	0.086775	CLO SE	FRE SH	43	51	46	56
Parmegia ni	20 11	-0.02246	0.08582	OPE N	FRE SH	76	107	77	106
Forman	20 12	-0.08776	0.023733	OPE N	FRE SH	170	187	264	266
Antinori	20 07	-0.00882	0.012103	OPE N	FRE SH	295	305	685	702
Montjean D	20 15	-0.2369	0.027324	OPE N	FRE SH	295	376	349	351

Supplementary Table S5: Treatment effect and standard error per study for the blastocyst formation rate per oocyte retrieved outcome.

AUTHOR	YE AR	Treatmen t Effect	Standard Error of Treatment Effect	Gro up 1	Grou p 2	Blastocysts group 1	MII oocytes retrieved group 1	Blastocysts group 2	MII oocytes retrieved group 2
Gullo	20 20	-0.05429	0.060687	OPE N	CLO SE	314	790	329	784
Buderats ka	20 20	-0.11199	0.099977	OPE N	FRE SH	64	121	155	262
De Gheselle	20 20	-0.53779	0.139642	OPE N	FRE SH	64	287	84	220
Garcia	20 11	-0.35105	0.106353	CLO SE	FRE SH	79	283	276	696

Chamayou	2017	-0.26192	0.104249	OPE N	FRE SH	138	615	135	463
Papatheodorou	2016	-0.09734	0.048003	CLO SE	FRE SH	440	984	484	982
Forman	2012	-0.73089	0.126449	OPE N	FRE SH	65	294	135	294
Chang	2013	-0.00448	0.148511	OPE N	FRE SH	59	186	65	204
Montjean D	2015	-0.86599	0.158103	OPE N	FRE SH	53	648	105	540

Supplementary Table S6: Treatment effect and standard error per study for the blastocyst formation rate per 2PN zygote outcome.

AUTHOR	YEAR	Treatment Effect	Standard Error of Treatment Effect	Group 1	Group 2	Blastocysts group 1	2PN zygotes group 1	Blastocysts group 2	2PN zygotes group 2
Gullo	2020	-0.03495	0.053636	OPE N	CLO SE	314	594	329	601
Buderatska	2020	-0.12502	0.087667	OPE N	FRE SH	64	102	155	218
De Gheselle	2020	-0.28451	0.122273	OPE N	FRE SH	64	160	84	158
Garcia	2011	-0.09305	0.096959	CLO SE	FRE SH	79	191	276	608
Chamayou	2017	-0.15888	0.096464	OPE N	FRE SH	138	411	135	343
Papatheodorou	2016	-0.02775	0.041695	CLO SE	FRE SH	440	744	484	796
Forman	2012	-0.3785	0.116983	OPE N	FRE SH	65	187	135	266
Chang	2013	0.113307	0.133166	OPE N	FRE SH	59	124	65	153
Montjean D	2015	-0.75247	0.151272	OPE N	FRE SH	53	376	105	351

Supplementary Table S7: Treatment effect and standard error per study for the clinical pregnancy rate outcome.

AUTHOR	YEAR	Treatment Effect	Standard Error of Treatment Effect	Group 1	Group 2	Clinical Pregnancies group 1	Patients group 1	Clinical Pregnancies group 2	Patients group 2
De Munck	2016	0.182322	0.499019	OPEN	CLOSE	6	17	5	17
Rienzi	2020	-0.14953	0.2283	OPEN	FRESH	15	40	54	124

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Porcu	2 0 2 1	- 0.1871 4	0.133256	OP EN	CL OS E	79	369	95	368
Gullo	2 0 2 0	- 0.0434 9	0.149821	OP EN	CL OS E	45	95	47	95
Cobo	2 0 1 0	0.0273 99	0.083872	OP EN	FR ES H	148	300	144	300
Sole	2 0 1 3	0.1201 44	0.141218	OP EN	FR ES H	53	99	47	99
Pujol	2 0 1 9	0.2231 44	0.25	OP EN	CL OS E	20	40	16	40
Papath eodoro u	2 0 1 3	- 0.2513 1	0.24081	OP EN	CL OS E	21	75	27	75
Garcia	2 0 1 1	0.0289 88	0.161401	CL OS E	FR ES H	21	34	51	85
Trokou des	2 0 1 1	0.1300 53	0.218705	OP EN	FR ES H	20	36	20	41
Papath eodoro u	2 0 1 6	0.0571 58	0.128013	CL OS E	FR ES H	54	92	51	92