Ovarian function and obstetrical outcome:
A window of endometrial vulnerability

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A window of endometrial vulnerability

Ovarian function and obstetrical outcome:

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COS and ART: wed by necessity

ART and obstetrical outcome: a little small, a little early

Fresh and frozen embryo transfers: the unexpected

COS and oocyte quality

COS and obstetrical outcome

Window of receptivity and endometrial vulnerability

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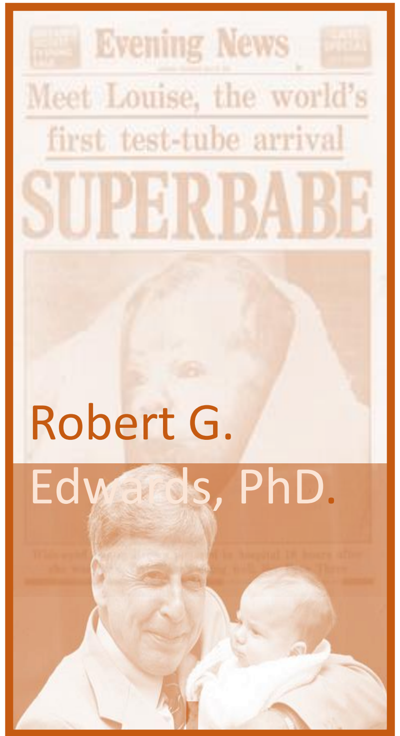

Robert G. Edwards, PhD.

ovulation

Ovarian function and obstetrical outcome:

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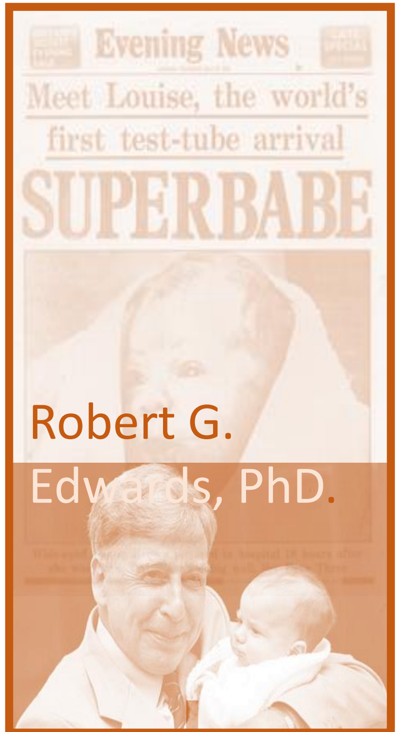

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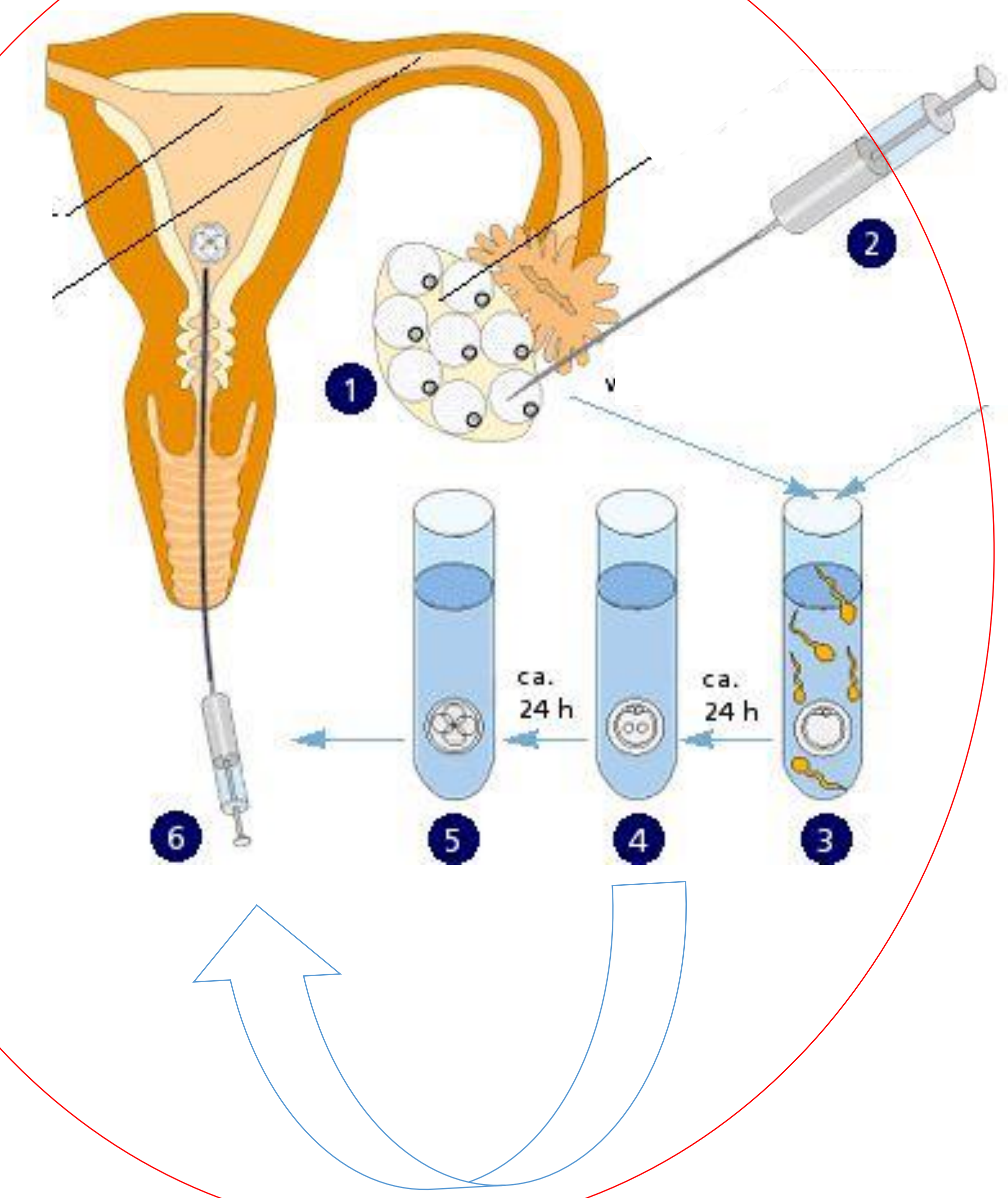
COS

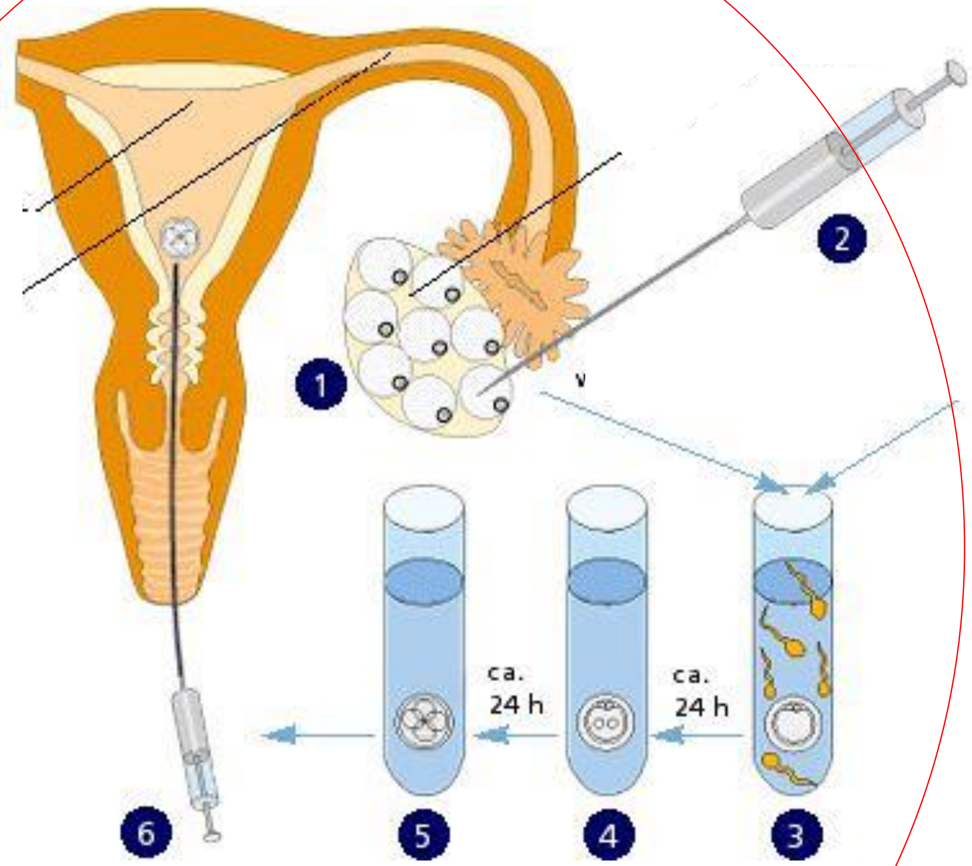
ovulation

Multiple ovulation

Risk of ART

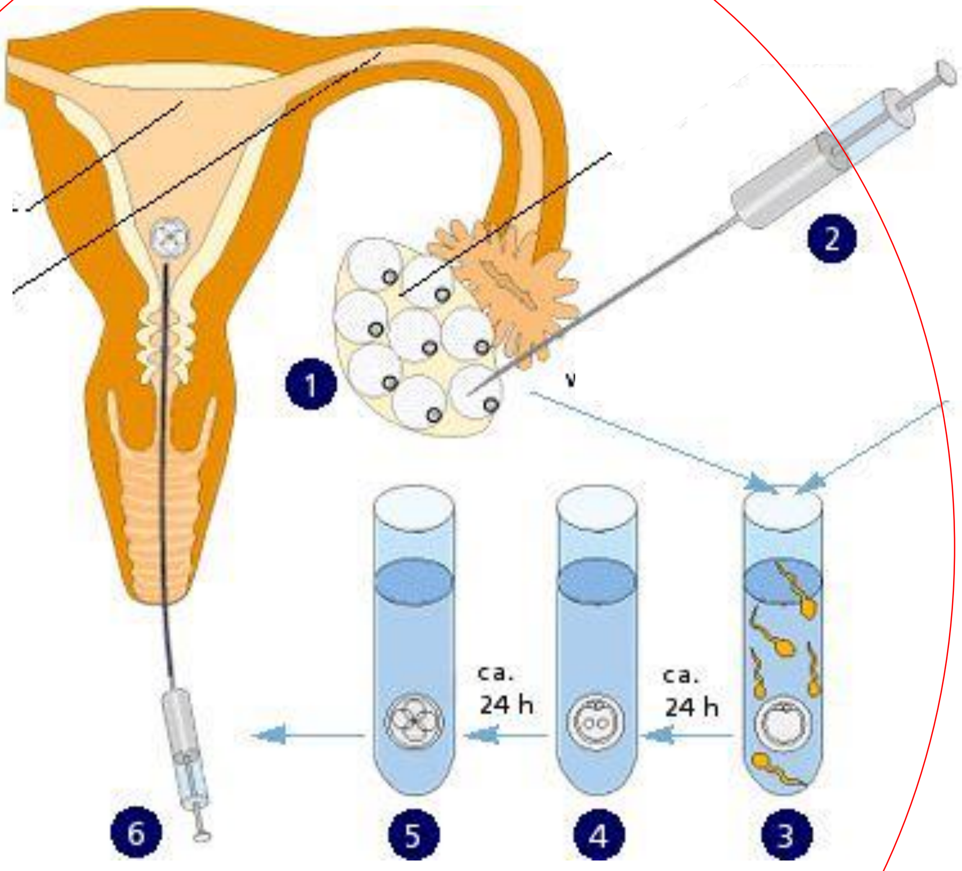


Risk of ART



COS

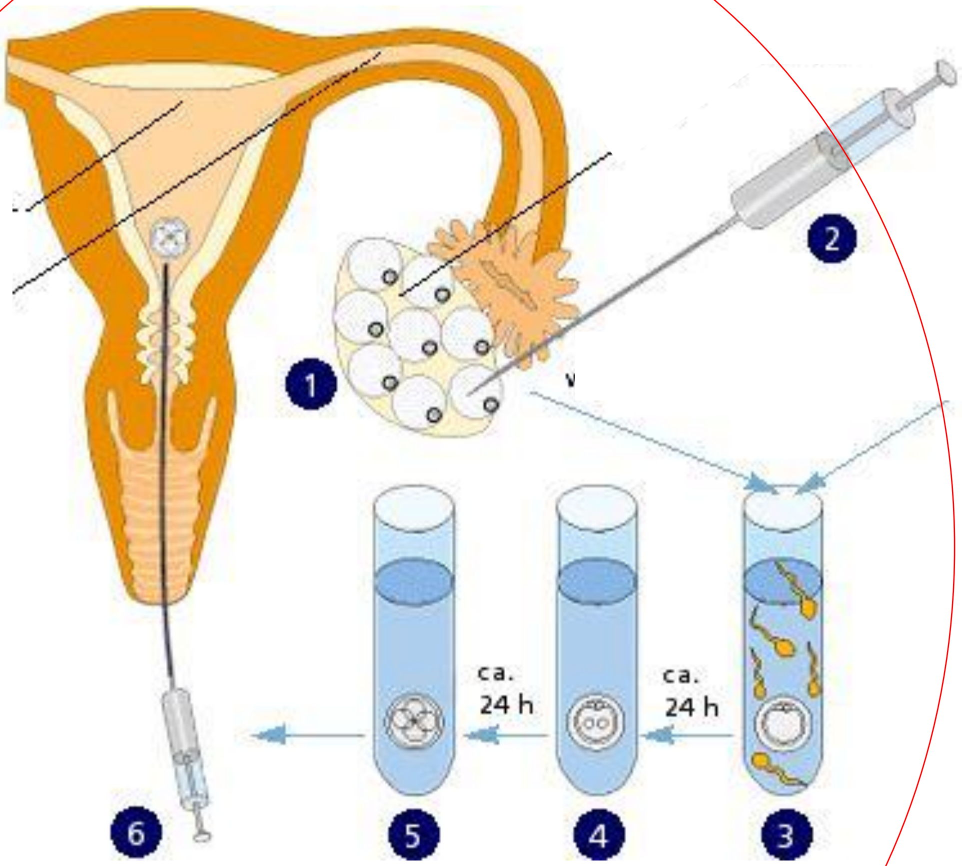
Risk of ART



COS

ICSI vs. nat fert

Risk of ART



COS

ICSI vs. nat fert

Freezing/Vitri

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Ovarian function and obstetrical outcome:

A window of endometrial vulnerability

Assisted reproductive technology and the risk of preterm birth among primiparas

Galit Levi Dunietz, M.A., M.P.H.,[a] Claudia Holzman, Ph.D., D.V.M.,[a] Patricia McKane, M.P.H., D.V.M.,[b]

Fertil Steril 2015;103:974-9.

Ovarian function and obstetrical outcome:

A window of endometrial vulnerability

Singletons born to primiparas conceived naturally or by ART

(female or male infertility)

Maternal and pregnancy characteristics for ART and non-ART primiparas with live births of singletons in Florida and Massachusetts 2000–2010 and Michigan 2000–2009.

		ART				
Characteristic	**Non-ART**	**Female infertility**	**Male infertility**	**Combined infertility**	**Unexplained infertility**	***P* value**
Sample size, N (%)	1,804,100 (98.8	9,891 (0.5)	4,819 (0.3)	3,688 (0.2)	2,930 (0.2)	
Maternal age, mean (SD)	25.5 (6.1)	35.6 (5.2)	33.4 (4.1)	34.8 (5.0)	35.3 (4.1)	<.01

Outcome	**Non-ART**	**Female infertility**	**Male infertility**	**Combined infertility**	**Unexplained infertility**
PTB <37 wk					
cOR (95% CI)	Reference	1.69 (1.59, 1.79)	1.21 (1.10, 1.33)	1.58 (1.44, 1.74)	1.21 (1.08, 1.37)
aOR (95% CI)[a]	Reference	1.60 (1.50, 1.70)	1.24 (1.13, 1.37)	1.49 (1.35, 1.64)	1.26 (1.12, 1.43)
PTB/early term <39 wk					
cOR (95% CI)	Reference	1.47 (1.41, 1.53)	1.12 (1.06, 1.19)	1.44 (1.35, 1.54)	1.08 (1.00, 1.17)
aOR (95% CI)[a]	Reference	1.48 (1.42, 1.54)	1.19 (1.12, 1.26)	1.39 (1.30, 1.49)	1.23 (1.14, 1.33)

Fertil Steril 2015;103:974-9.

Human Reproduction Update, Vol.19, No.2 pp. 87–104, 2013
Advanced Access publication on November 14, 2012 doi:10.1093/humupd/dms044

human reproduction update

Why do singletons conceived after assisted reproduction technology have adverse perinatal outcome? Systematic review and meta-analysis

A. Pinborg[1,*], U.B. Wennerholm[2], L.B. Romundstad[3], A. Loft[1], K. Aittomaki[4], V. Söderström-Anttila[5], K.G. Nygren[6], J. Hazekamp[7], and C. Bergh[8]

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Effects of infertility

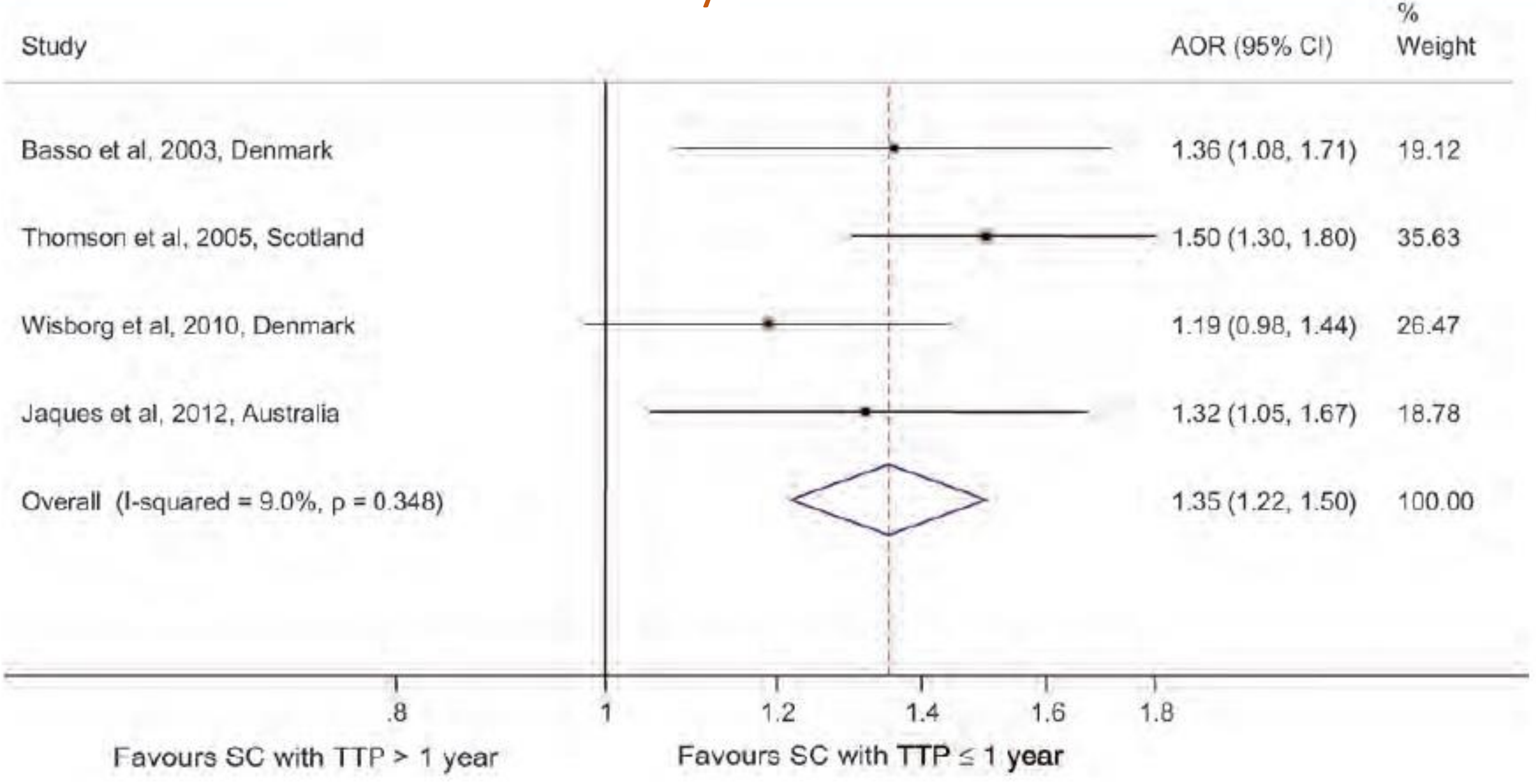

Figure 1 Pooled estimate on the risk of PTB in SC singletons of subfertile women with TTP > 1 year versus SC singletons of fertile women with TTP ≤ 1 year. $\tau^2 = 0.0010$. SC, spontaneous conception; AOR, adjusted odds ratio; CI, confidence interval.

ART vs. infertility

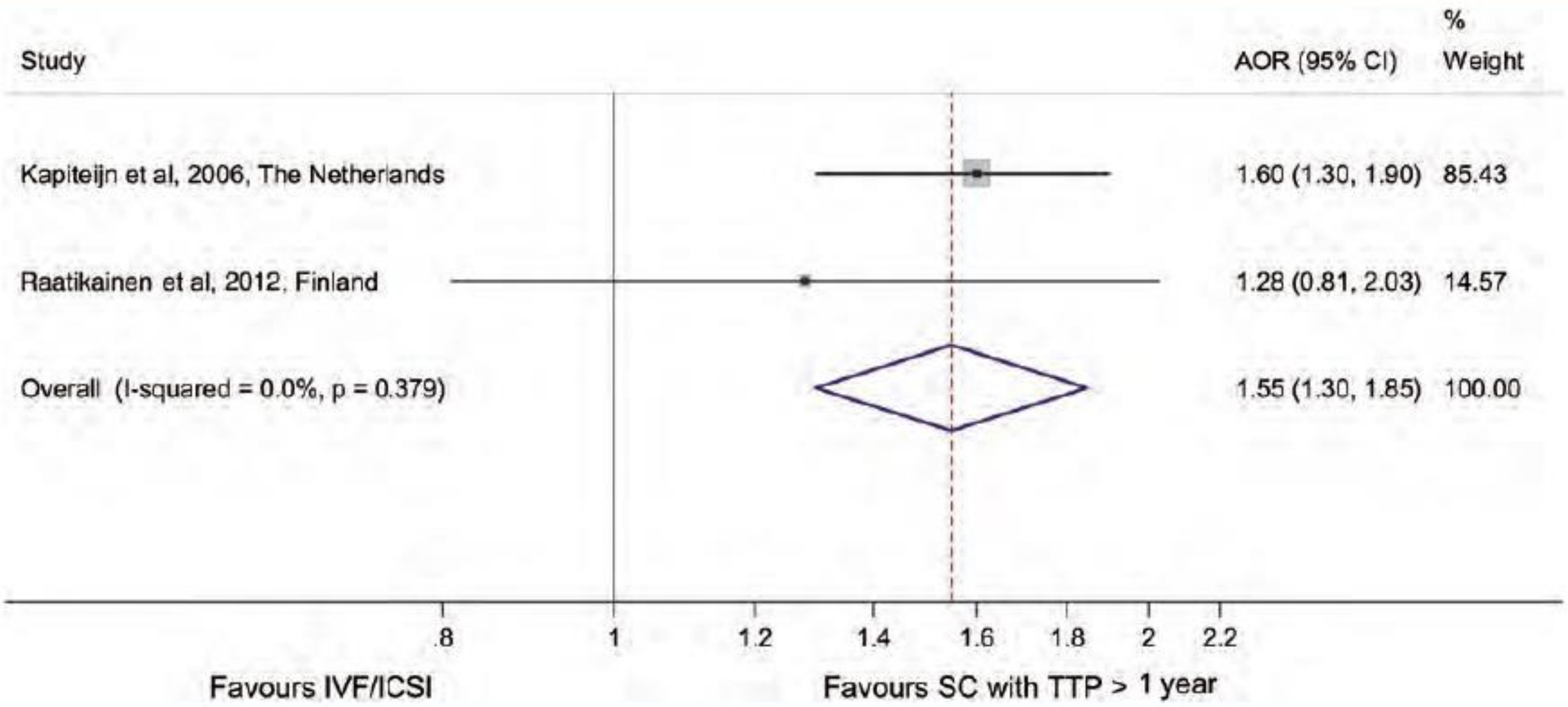

Figure 2 Pooled estimate on the risk of PTB in singletons born after IVF/ICSI versus SC singletons of subfertile women (TTP > 1 year). $\tau^2 = 0.0000$.

ART vs. SC siblings

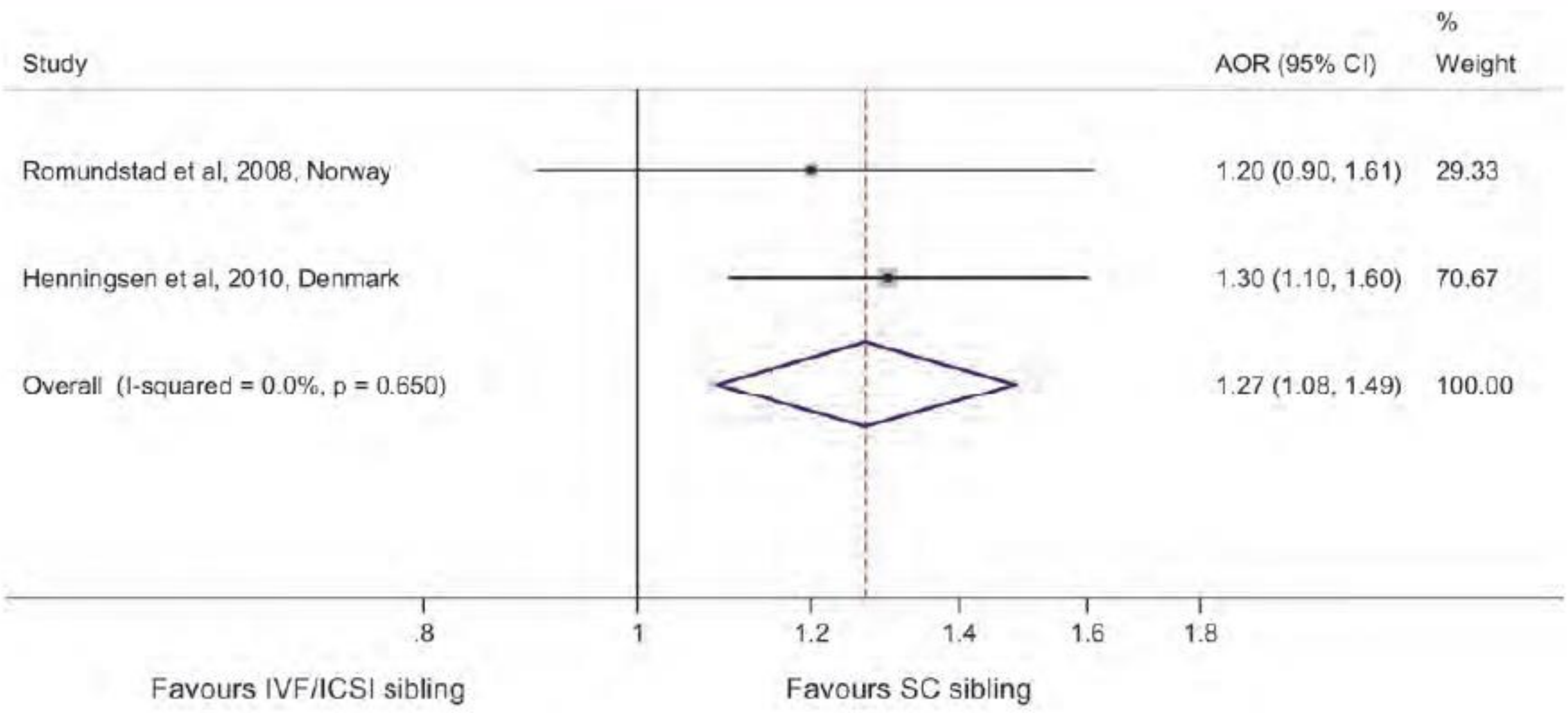

Figure 3 Pooled estimate on the risk of PTB in sibling studies of mothers to consecutive-singleton siblings of an IVF/ICSI child and an SC child. $\tau^2 = 0.0000$.

COS IUI vs. SC

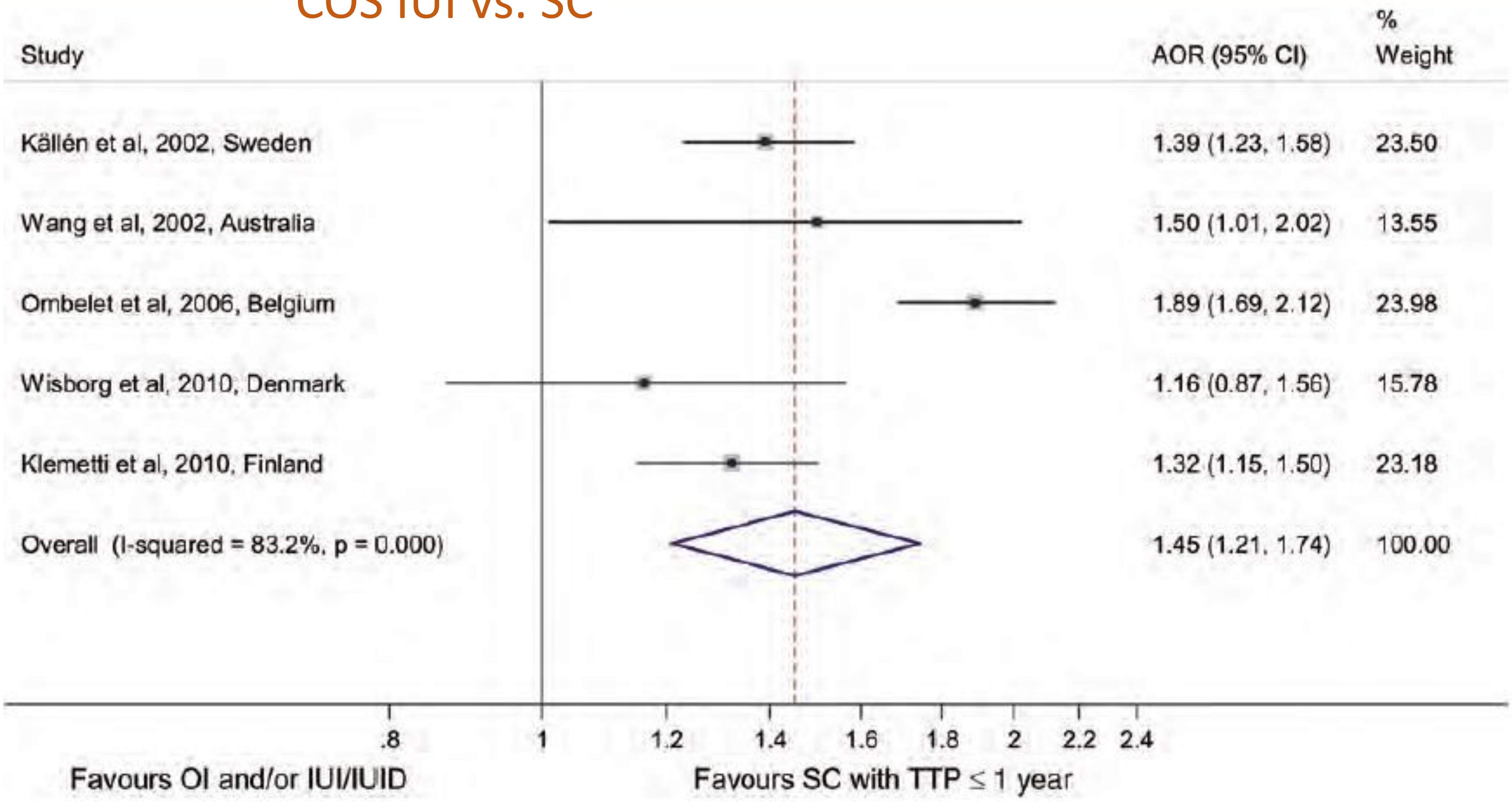

Figure 4 Pooled estimate on the risk of PTB in singletons born after OI and/or intrauterine insemination/donor (IUI/IUID) versus SC singletons of fertile women with TTP $\leq$ 1 year. $\tau^2 = 0.0329$.

Frozen vs fresh ET

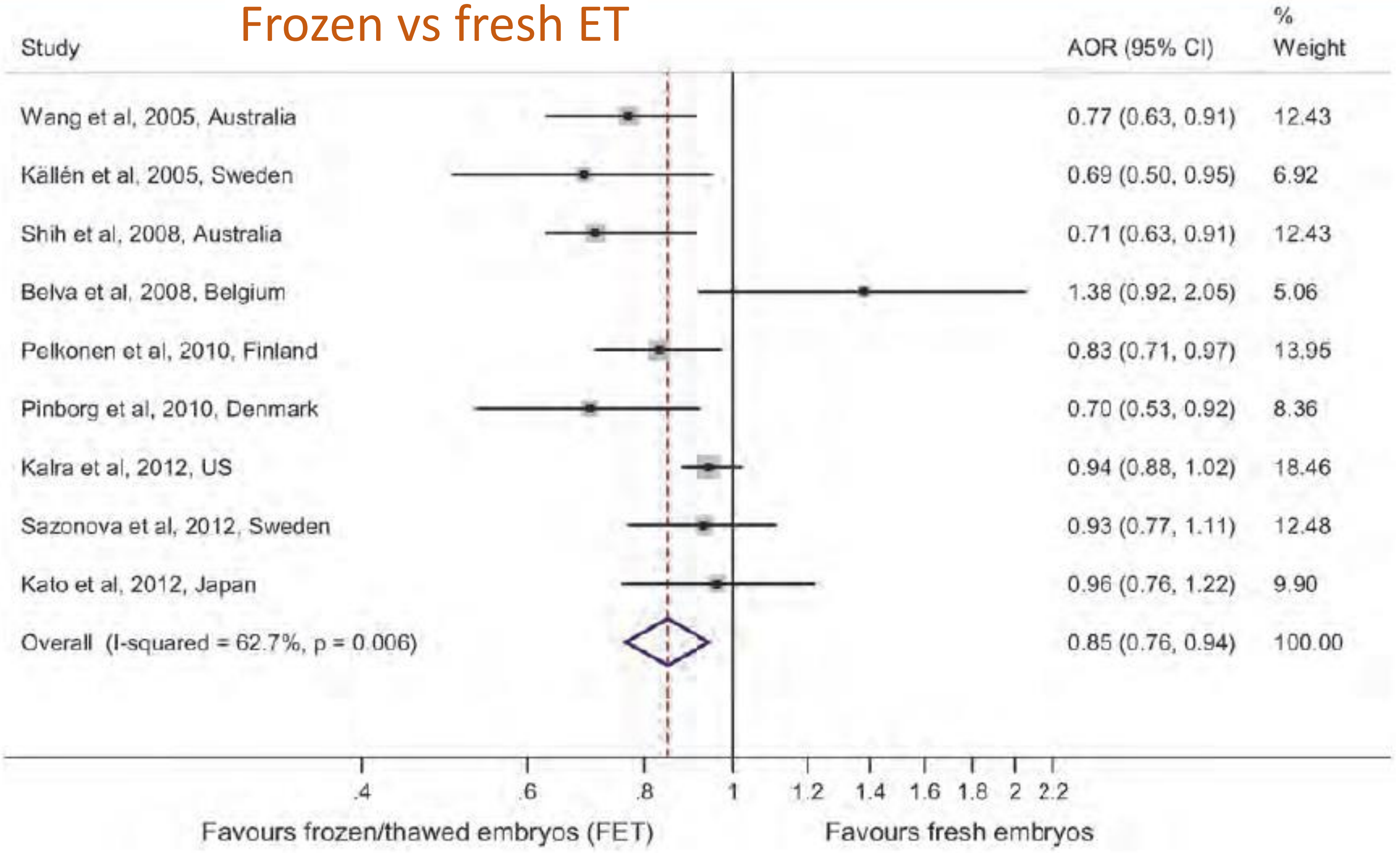

Figure 6 Pooled estimate on the risk of PTB in singletons born after IVF/ICSI in frozen/thawed cycles versus singletons born after IVF/ICSI in fresh cycles. $\tau^2 = 0.0138$.

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Ovarian function and obstetrical outcome:

A window of endometrial vulnerability

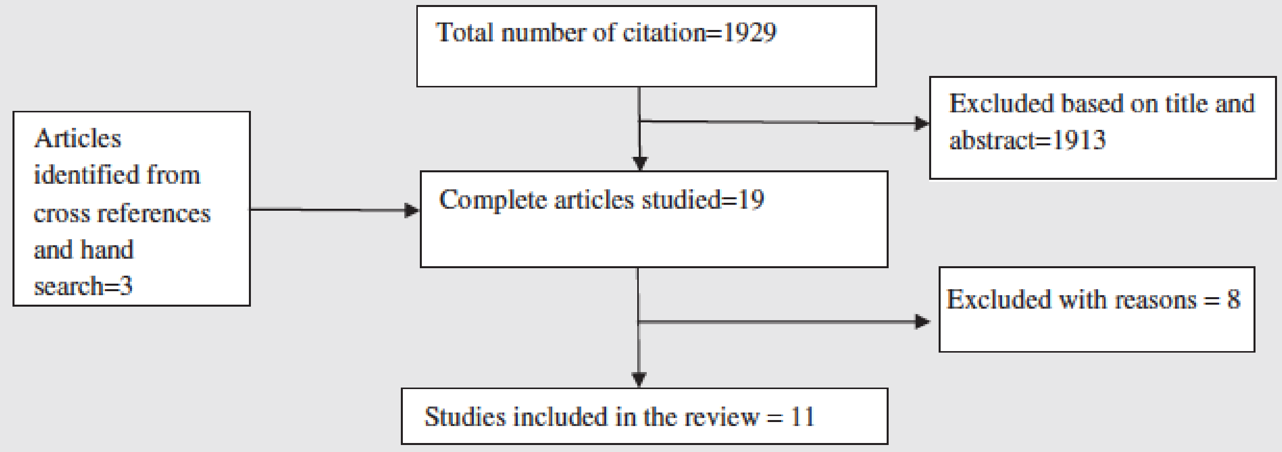
Obstetric and perinatal outcomes in singleton pregnancies resulting from the transfer of frozen thawed versus fresh embryos generated through in vitro fertilization treatment: a systematic review and meta-analysis

Abha Maheshwari, M.D.,[a] Shilpi Pandey, M.R.C.O.G.,[b] Ashalatha Shetty, M.D.,[b] Mark Hamilton, M.D.,[b] and Siladitya Bhattacharya, M.D.[a]

Fertil Steril 2012;98:36877.

Ovarian function and obstetrical outcome:

A window of endometrial vulnerability



Selection of studies included in the review.

Maheshwari. Frozen versus fresh ET. Fertil Steril 2012.

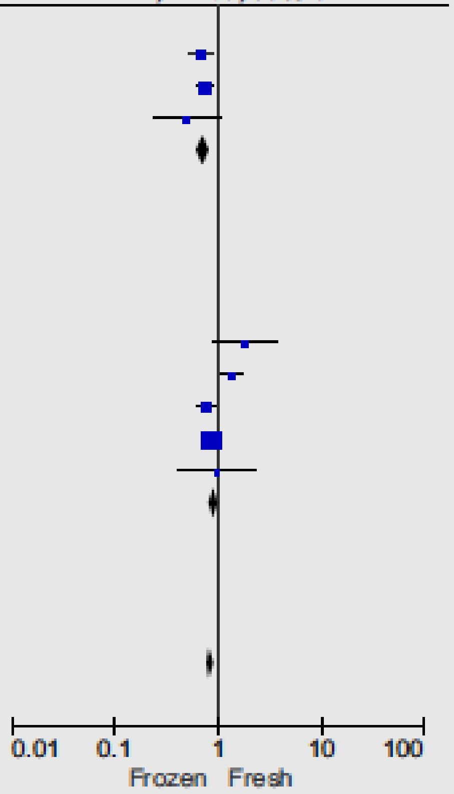
Fertil Steril 2012;98:36877.

Preterm labor

SUPPLEMENTAL FIGURE 2

Study or Subgroup	Frozen Events	Frozen Total	Fresh Events	Fresh Total	Weight	Risk Ratio M-H, Fixed, 95% CI
5.8.1 matched cohort						
Pinborg 2010	59	957	940	10,329	10.7%	0.68 [0.53, 0.87]
Shih 2008	220	2,387	383	3110	22.3%	0.75 [0.64, 0.88]
Wennerholm 1997	9	160	18	160	1.2%	0.50 [0.23, 1.08]
Subtotal (95% CI)		**3,504**		**13,599**	**34.2%**	**0.72 [0.63, 0.82]**
Total events	288		1,341			
Heterogeneity: χ^2 = 1.32, df = 2 (*P* = .52); I^2 = 0%						
Test for overall effect: Z = 4.93 (*P* < .00001)						
5.8.2 unmatched cohort						
Aflatoonian2010	11	84	18	252	0.6%	1.83 [0.90, 3.72]
Belva 2008	78	662	266	2,999	6.4%	1.33 [1.05, 1.69]
Pelkonen 2010	120	1,830	258	2,942	13.3%	0.75 [0.61, 0.92]
Wang 2005	437	3,834	1,008	7,695	44.9%	0.87 [0.78, 0.97]
Wikland 2010	7	103	14	199	0.6%	0.97 [0.40, 2.32]
Subtotal (95% CI)		**6,513**		**14,087**	**65.8%**	**0.90 [0.83, 0.98]**
Total events	653		1,564			
Heterogeneity: χ^2 = 17.62, df = 4 (*P* = .001); I^2 = 77%						
Test for overall effect: Z = 2.40 (*P* = .02)						
Total (95% CI)		**10,017**		**27,686**	**100.0%**	**0.84 [0.78, 0.90]**
Total events	941		2,905			
Heterogeneity: χ^2 = 27.25, df = 7 (*P* = .0003); I^2 = 74%						
Test for overall effect: Z = 4.82 (*P* < .00001)						
Test for subgroup differences: χ^2 = 7.95, df = 1 (*P* = .005), I^2 = 87.4%						

Risk Ratio M-H, Fixed, 95% CI



Preterm labor. CI = confidence interval; M-H = Mantel-Haenszel.

Maheshwari. Frozen versus fresh ET. Fertil Steril 2012.

Fertil Steril 2012;98:36877.

Ovarian function and obstetrical outcome:

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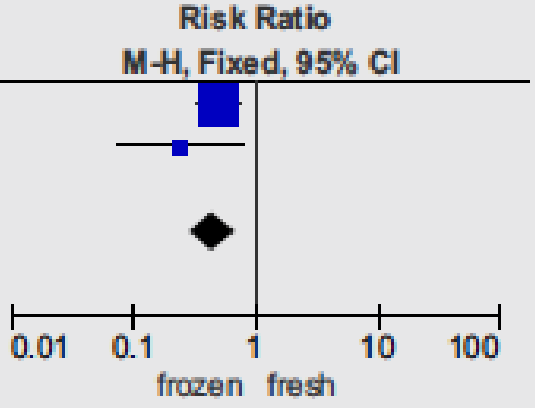
SGA

SUPPLEMENTAL FIGURE 4

Study or Subgroup	Frozen Events	Frozen Total	Fresh Events	Fresh Total	Weight	Risk Ratio M-H, Fixed, 95% CI
Pelkonen 2010	28	1,830	91	2,942	81.0%	0.49 [0.33, 0.75]
Wikland 2010	3	103	24	199	19.0%	0.24 [0.07, 0.78]
Total (95% CI)		1,933		3,141	100.0%	0.45 [0.30, 0.66]
Total events	31		115			

Heterogeneity: $\chi^2 = 1.28$, df = 1 ($P = .26$); $I^2 = 22\%$

Test for overall effect: $Z = 4.01$ ($P < .0001$)



Small for gestational age. CI = confidence interval; M-H = Mantel-Haenszel.

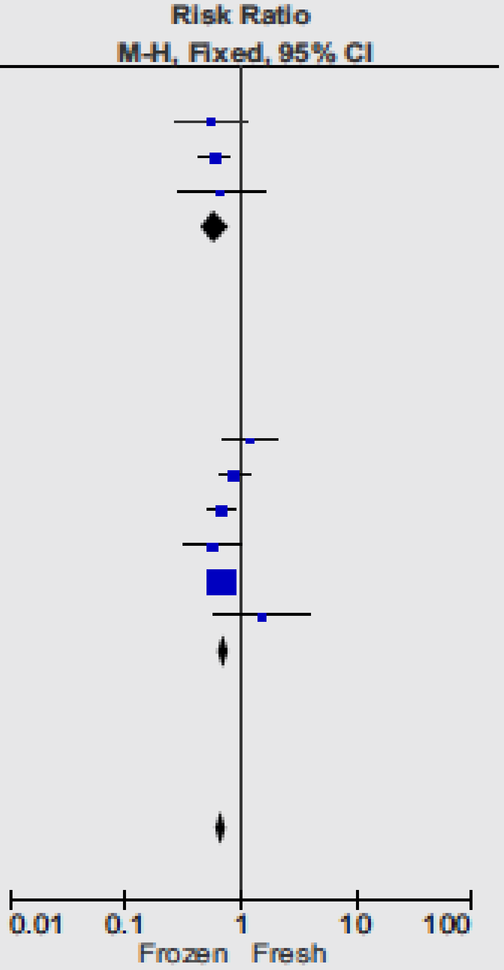
Maheshwari. Frozen versus fresh ET. Fertil Steril 2012.

Fertil Steril 2012;98:36877.

Low birth weight

SUPPLEMENTAL FIGURE 5

Study or Subgroup	Frozen Events	Frozen Total	Fresh Events	Fresh Total	Weight	Risk Ratio M-H, Fixed, 95% CI
5.6.1 matched cohort						
Henningsen 2011	11	716	20	716	2.0%	0.55 [0.27, 1.14]
Pinborg 2010	42	957	764	10,329	13.0%	0.59 [0.44, 0.80]
Wennerholm 1997	8	160	12	160	1.2%	0.67 [0.28, 1.59]
Subtotal (95% CI)		**1,833**		**11,205**	**16.3%**	**0.59 [0.45, 0.78]**
Total events	61		796			
Heterogeneity: $\chi^2 = 0.11$, df = 2 ($P = .95$); $I^2 = 0\%$						
Test for overall effect: $Z = 3.83$ ($P = .001$)						
5.6.2 unmatched cohort						
Aflatoonian2010	16	84	40	252	2.0%	1.20 [0.71, 2.03]
Belva 2008	44	662	227	2,999	8.3%	0.88 [0.64, 1.20]
Pelkonen 2010	76	1,830	177	2,942	13.7%	0.69 [0.53, 0.90]
Wada et al., 1994	13	177	68	527	3.4%	0.57 [0.32, 1.00]
Wang 2005	277	3,847	829	7,676	55.7%	0.67 [0.59, 0.76]
Wikland 2010	7	103	9	199	0.6%	1.50 [0.58, 3.92]
Subtotal (95% CI)		**6,703**		**14,595**	**83.7%**	**0.71 [0.64, 0.78]**
Total events	433		1,350			
Heterogeneity: $\chi^2 = 9.51$, df = 5 ($P = .09$); $I^2 = 47\%$						
Test for overall effect: $Z = 6.53$ ($P < .00001$)						
Total (95% CI)		**8,536**		**25,800**	**100.0%**	**0.69 [0.62, 0.76]**
Total events	494		2,146			
Heterogeneity: $\chi^2 = 11.16$, df = 8 ($P = .19$); $I^2 = 28\%$						
Test for overall effect: $Z = 7.53$ ($P < .00001$)						
Test for subgroup differences: $\chi^2 = 1.42$, df = 1 ($P = .23$), $I^2 = 29.5\%$						



Low birth weight (birth weight <2,500 g). CI = confidence interval; M-H = Mantel-Haenszel.

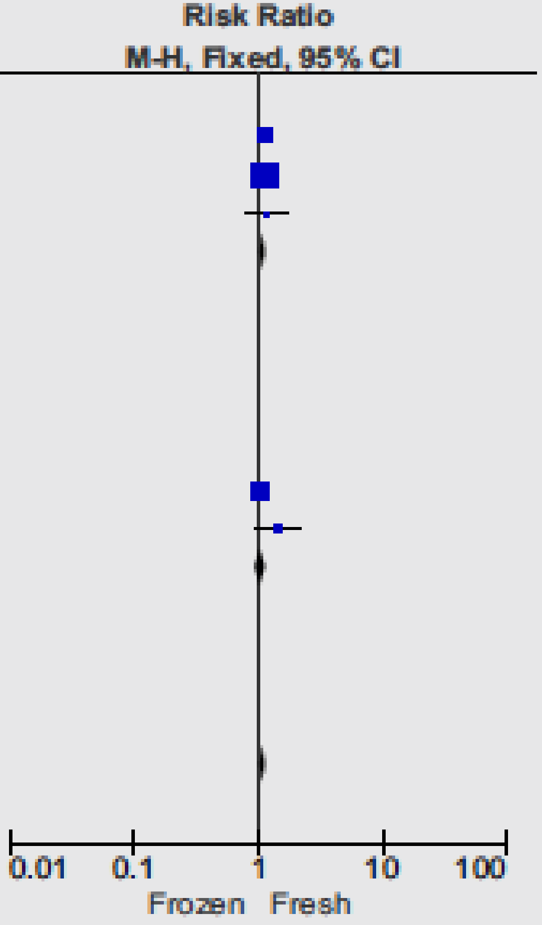
Maheshwari. Frozen versus fresh ET. Fertil Steril 2012.

Fertil Steril 2012;98:36877.

CS

SUPPLEMENTAL FIGURE 7

Study or Subgroup	Frozen Events	Frozen Total	Fresh Events	Fresh Total	Weight	Risk Ratio M-H, Fixed, 95% CI
5.1.1 Matched cohort						
Pinborg 2010	288	957	2,733	10,329	21.0%	1.14 [1.03, 1.26]
Shih 2008	1,031	2,387	1,207	3,110	47.6%	1.11 [1.04, 1.19]
Wennerholm 1997	42	160	36	160	1.6%	1.17 [0.79, 1.72]
Subtotal (95% CI)		**3,504**		**13,599**	**70.3%**	**1.12 [1.06, 1.18]**
Total events	1,361		3,976			
Heterogeneity: $\chi^2 = 0.17$, df = 2 ($P = .92$); $I^2 = 0\%$						
Test for overall effect: Z = 4.19 ($P < .0001$)						
5.1.2 unmatched cohort						
Pelkonen 2010	519	1,830	818	2,942	28.5%	1.02 [0.93, 1.12]
Wikland 2010	30	101	41	199	1.3%	1.44 [0.96, 2.16]
Subtotal (95% CI)		**1,931**		**3,141**	**29.7%**	**1.04 [0.95, 1.14]**
Total events	549		859			
Heterogeneity: $\chi^2 = 2.66$, df = 1 ($P = .10$); $I^2 = 62\%$						
Test for overall effect: Z = 0.80 ($P = .42$)						
Total (95% CI)		**5,435**		**16,740**	**100.0%**	**1.10 [1.05, 1.15]**
Total events	1,910		4835			
Heterogeneity: $\chi^2 = 4.86$, df = 4 ($P = .30$); $I^2 = 18\%$						
Test for overall effect: Z = 3.90 ($P < .0001$)						
Test for subgroup differences: $\chi^2 = 2.08$, df = 1 ($P = .15$), $I^2 = 51.9\%$						



Cesarean section. CI = confidence interval; M-H = Mantel-Haenszel.

Maheshwari. Frozen versus fresh ET. Fertil Steril 2012.

Fertil Steril 2012;98:36877.

Ovarian function and obstetrical outcome:

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Human Reproduction, Vol.28, No.9 pp. 2545–2553, 2013
Advanced Access publication on July 5, 2013 doi:10.1093/humrep/det272

human reproduction ORIGINAL ARTICLE *Reproductive epidemiology*

Perinatal outcomes of children born after frozen-thawed embryo transfer: a Nordic cohort study from the CoNARTaS group

Ulla-Britt Wennerholm[1,†*], Anna-Karina Aaris Henningsen[2,†], Liv Bente Romundstad[3,4], Christina Bergh[1], Anja Pinborg[2], Rolv Skjaerven[5,6], Julie Forman[7], Mika Gissler[8,9], Karl Gösta Nygren[10], and Aila Tiitinen[11]

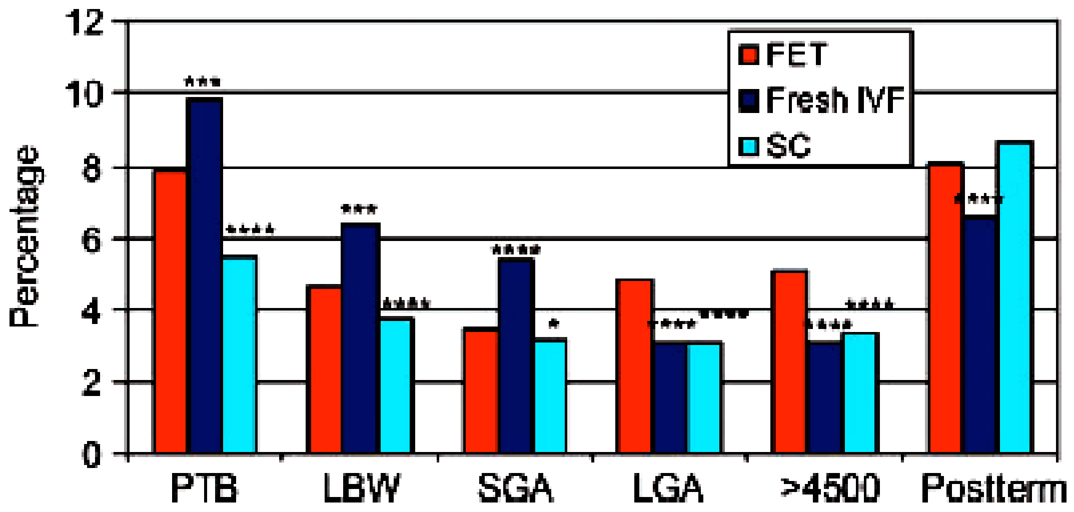

Figure 3 Distribution of gestational age and birthweight in children born after FET, fresh IVF (IVF, ICSI, IVF/ICSI) and spontaneous conception (SC). FET versus fresh IVF: PTB: $P = 0.0003$, LBW: $P = 0.0007$, SGA: $P < 0.0001$, LGA: $P < 0.0001$, $\geq$4500 g: $P < 0.0001$, post-term birth: $P < 0.0001$ (adjusted P values). FET versus SC: PTB: $P < 0.0001$, LBW: $P < 0.0001$, SGA: $P = 0.02$, LGA: $P < 0.0001$, $\geq$4500 g: $P < 0.0001$ (adjusted P values). PTB, preterm birth; LBW, low birthweight; SGA, small for gestational age; LGA, large for gestational age; $\geq$4500, birth weight $\geq$4500 g; postterm, $\geq$42 weeks. * $P < 0.05$, *** $P < 0.001$, **** $P < 0.0001$.

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Human Reproduction, Vol.29, No.6 pp. 1218–1224, 2014
Advanced Access publication on March 20, 2014 doi:10.1093/humrep/deu053

human reproduction

ORIGINAL ARTICLE *Infertility*

Association between response to ovarian stimulation and miscarriage following IVF: an analysis of 124 351 IVF pregnancies

Sesh Kamal Sunkara[1,*], Yacoub Khalaf[1], Abha Maheshwari[2], Paul Seed[1], and Arri Coomarasamy[3]

[1]King's College London, London, UK [2]University of Aberdeen, Aberdeen, UK [3]University of Birmingham, Birmingham, UK

*Correspondence address. E-mail: sksunkara@hotmail.com

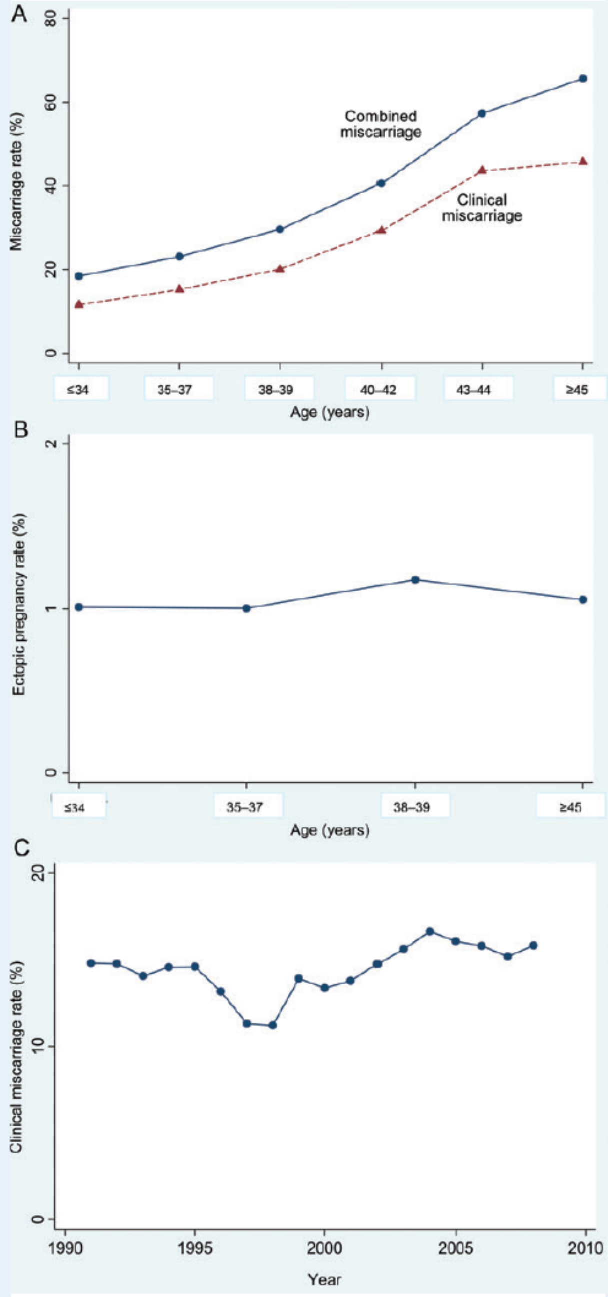

Figure 2 (**A**) Miscarriage rate by age. (**B**) Ectopic pregnancy rate by age. (**C**) Clinical miscarriage rate by time period.

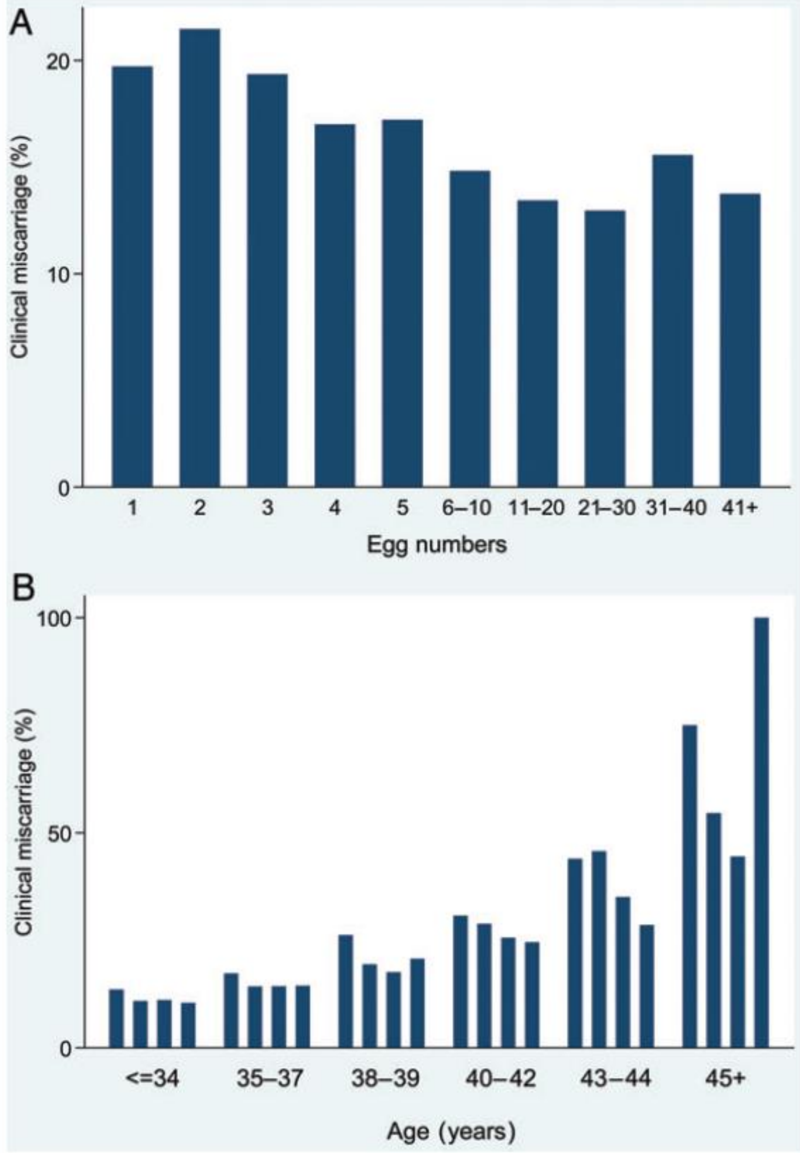

Figure 3 Relationship between oocyte number and clinical miscarriage rate. (**A**) Overall association. (**B**) Stratified by age group. Each age group was divided according to oocyte number; from left to right: 1–3 oocytes, 4–9 oocytes, 10–14 oocytes, ≥15 oocytes.

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Ovarian function and obstetrical outcome:

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Association of number of retrieved oocytes with live birth rate and birth weight: an analysis of 231,815 cycles of in vitro fertilization

Valerie L. Baker, M.D.,[a] Morton B. Brown, Ph.D.,[b] Barbara Luke, Sc.D., M.P.H.,[c] and Kirk P. Conrad, M.D.[d]

Fresh ET cycles with either **autologous** (n=194,627) or **donor** (n=37,188) oocytes reported to SART in the years 2004–2010

Fertil Steril 2015;103:931-8.

Birth outcomes by number of retrieved oocytes, oocyte source, and day of transfer for cycles with transfer of two embryos.

Oocyte source	Day of transfer	No. of retrieved oocytes	n	Length of gestation, wk (mean ± SD)	Birth weight, g (mean ± SD)	z-score (mean ± SD)	SGA, %	LBW, %
Autologus	Day 2-3	1–5	3,007	38.3 ± 2.1	3,263 ± 580	0.02 ± 0.96	8.1	8.3
Trend		6–10	7,352	38.4 ± 2.1	3,257 ± 581	−0.02 ± 0.97	8.9	8.7
w/ increasing oocytes		11–15	6,388	38.4 ± 2.2	3,244 ± 591	−0.05 ± 0.96	9.3	8.8
		16–25	5,538	38.3 ± 2.3	3,229 ± 605	−0.04 ± 0.95	8.4	9.7
		≥ 26	1,310	38.2 ± 2.3	3,193 ± 608	−0.07 ± 0.98	9.5	11.5
		P value for trend		.002	< .0001	.0009	.43	.0001
		Adjusted *P* value[a]		.01	.0001	.005	.31	.0002
Donor	Days 2–3	1–5	138	37.9 ± 2.9	3,222 ± 723	0.05 ± 1.08	14.0	14.6
		6–10	810	38.1 ± 2.3	3,229 ± 619	0.06 ± 0.95	8.3	11.4
		11–15	1,150	38.2 ± 2.3	3,280 ± 630	0.12 ± 1.02	8.0	10.1
		16–25	1,596	38.1 ± 2.5	3,220 ± 646	0.04 ± 0.99	7.8	11.4
		≥ 26	710	38.2 ± 2.1	3,291 ± 586	0.13 ± 0.97	7.6	8.9
		P value for trend		.59	.41	.42	.17	.21
		Adjusted *P* value[a]		.62	.39	.37	.16	.19
Autologus	Day 5-6	1–5	453	38.0 ± 2.1	3,260 ± 603	0.18 ± 0.98	6.7	8.8
		6–10	4,207	37.9 ± 2.1	3,243 ± 583	0.15 ± 0.99	6.8	9.4
Trend		11–15	6,789	37.9 ± 2.3	3,209 ± 603	0.07 ± 0.95	6.9	9.9
w/ increasing oocytes		16–25	9,081	37.9 ± 2.4	3,194 ± 625	0.05 ± 0.97	7.8	10.8
		≥ 26	2,951	37.8 ± 2.6	3,178 ± 641	0.07 ± 0.96	7.4	12.3
		P value for trend		.006	< .0001	< .0001	.06	< .0001
		Adjusted *P* value[a]		.01	< .0001	< .0001	.06	< .0001
Donor	Days 5–6	1–5	36	38 ± 2.7	3,260 ± 694	0.20 ± 1.05	5.6	8.3
		6–10	589	38 ± 2.7	3,226 ± 677	0.10 ± 1.03	8.9	10.5
		11–15	1,356	38 ± 2.4	3,255 ± 615	0.13 ± 0.99	6.1	9.3
		16–25	2,743	38 ± 2.4	3,236 ± 638	0.11 ± 1.00	7.3	10.6
		≥ 26	1,768	38 ± 2.5	3,223 ± 660	0.07 ± 0.96	8.1	10.7
		P value for trend		.80	.51	.14	.34	.73
		Adjusted *P* value[a]		.80	.58	.19	.37	.77

[a] The *P* value for trend was adjusted for female age and previous births.

Baker. Oocyte number and IVF outcomes. Fertil Steril 2015.

Birth outcomes by number of retrieved oocytes, oocyte source, and day of transfer for cycles with transfer of two embryos.

Oocyte source	Day of transfer	No. of retrieved oocytes	n	Length of gestation, wk (mean ± SD)	Birth weight, g (mean ± SD)	z-score (mean ± SD)	SGA, %	LBW, %
Autologus Day 2-3		1–5	3,007	38.3 ± 2.1	3,263 ± 580	0.02 ± 0.96	8.1	8.3
Trend		6–10	7,352	38.4 ± 2.1	3,257 ± 581	−0.02 ± 0.97	8.9	8.7
w/ increasing oocytes		11–15	6,388	38.4 ± 2.2	3,244 ± 591	−0.05 ± 0.96	9.3	8.8
		16–25	5,538	38.3 ± 2.3	3,229 ± 605	−0.04 ± 0.95	8.4	9.7
		≥ 26	1,310	38.2 ± 2.3	3,193 ± 608	−0.07 ± 0.98	9.5	11.5
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Baker. Oocyte number and IVF outcomes. Fertil Steril 2015.

Human Reproduction Update, Vol.20, No.3 pp. 439–448, 2014
Advanced Access publication on January 30, 2014 doi:10.1093/humupd/dmu001

human
reproduction
update

Neonatal outcomes among singleton births after blastocyst versus cleavage stage embryo transfer: a systematic review and meta-analysis

S. Dar[1,2,*], T. Lazer[1,2], P.S. Shah[3], and C.L. Librach[1,2,4]

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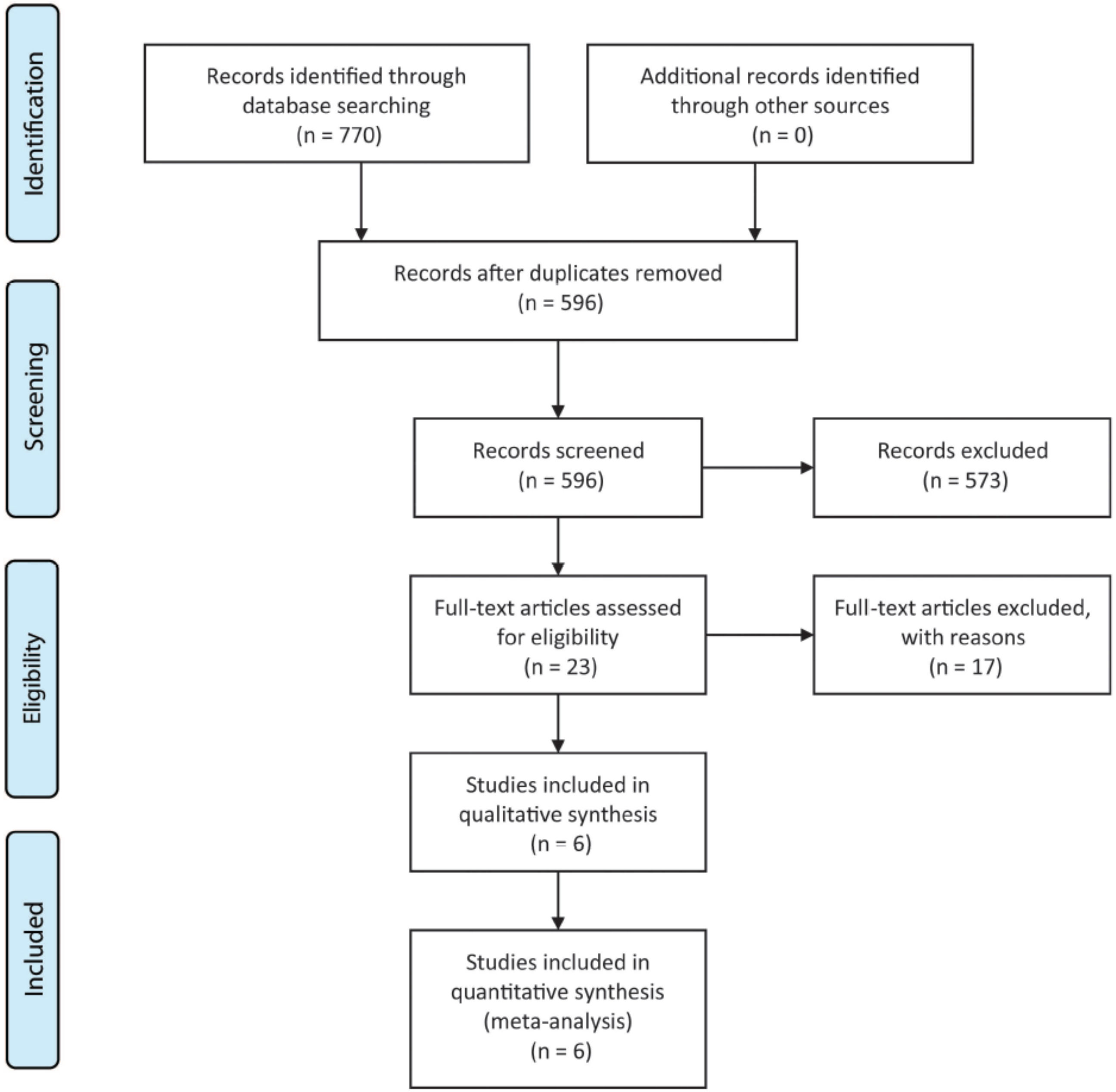


Figure 1 Flowchart for the selection of eligible studies.

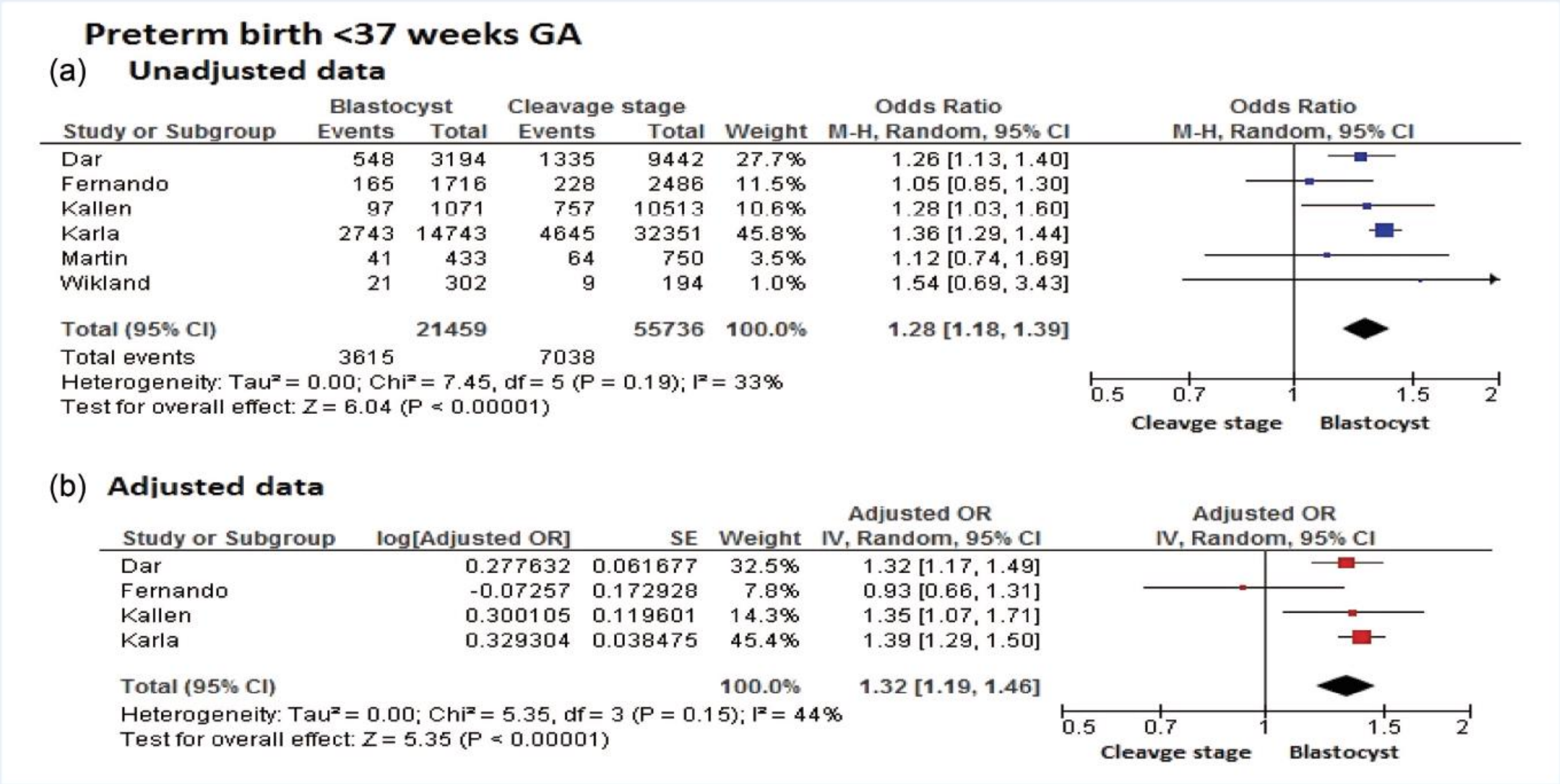


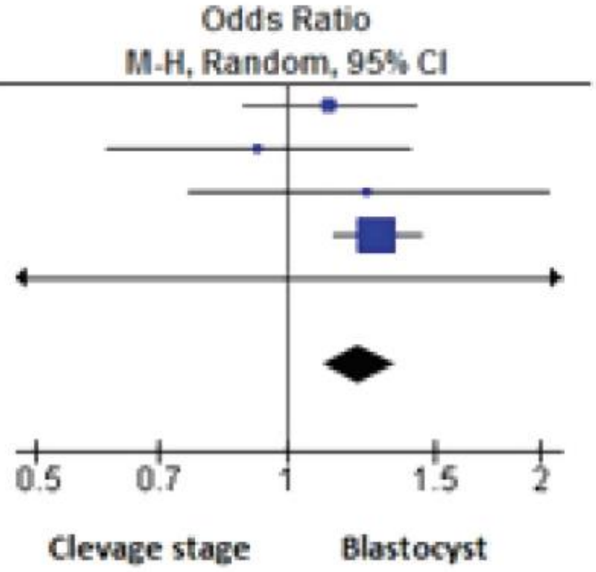
Figure 2 Meta-analysis of blastocyst versus cleavage stage embryo transfer for preterm birth <37 weeks. GA, gestational age.

Preterm birth at <32 weeks GA

(a) Unadjusted data

Study or Subgroup	Blastocyst Events	Blastocyst Total	Cleavage stage Events	Cleavage stage Total	Weight	Odds Ratio M-H, Random, 95% CI
Dar	95	3194	251	9442	18.6%	1.12 [0.88, 1.43]
Fernando	37	1716	58	2486	6.1%	0.92 [0.61, 1.40]
Kallen	18	1071	142	10513	4.4%	1.25 [0.76, 2.05]
Karla	414	14743	714	32351	70.8%	1.28 [1.13, 1.45]
Wikland	1	302	2	194	0.2%	0.32 [0.03, 3.54]
Total (95% CI)		**21026**		**54986**	**100.0%**	**1.22 [1.10, 1.35]**
Total events	565		1167			

Heterogeneity: $Tau^2 = 0.00$; $Chi^2 = 3.98$, $df = 4$ ($P = 0.41$); $I^2 = 0\%$
Test for overall effect: $Z = 3.78$ ($P = 0.0002$)



(b) Adjusted data

Study or Subgroup	log[Adjsted OR]	SE	Weight	Adjsted OR IV, Random, 95% CI
Dar	0.086178	0.133931	32.4%	1.09 [0.84, 1.42]
Fernando	-0.43078	0.330082	10.7%	0.65 [0.34, 1.24]
Kallen	0.364643	0.25886	15.4%	1.44 [0.87, 2.39]
Karla	0.300105	0.09031	41.5%	1.35 [1.13, 1.61]
Total (95% CI)			**100.0%**	**1.18 [0.93, 1.49]**

Heterogeneity: $Tau^2 = 0.03$; $Chi^2 = 5.97$, $df = 3$ ($P = 0.11$); $I^2 = 50\%$
Test for overall effect: $Z = 1.35$ ($P = 0.18$)

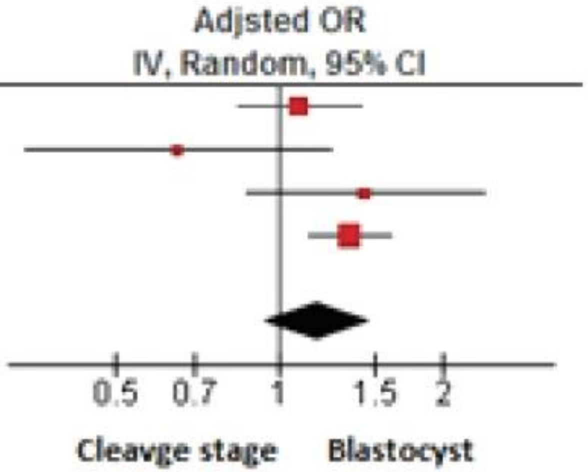


Figure 3 Meta-analysis of blastocyst versus cleavage stage embryo transfer for very preterm birth <32 weeks. GA, gestational age.

Ovarian function and obstetrical outcome:

A window of endometrial vulnerability

Human Reproduction, Vol.29, No.12 pp. 2794–2801, 2014
Advanced Access publication on October 14, 2014 doi:10.1093/humrep/deu246

human reproduction

ORIGINAL ARTICLE *Reproductive epidemiology*

Clinical outcomes following cryopreservation of blastocysts by vitrification or slow freezing: a population-based cohort study

Z. Li[1,2], Y.A. Wang[1,3], W. Ledger[1], D.H. Edgar[4], and E.A. Sullivan[1,2,*]

Ovarian function and obstetrical outcome:

A window of endometrial vulnerability

Table IV Adjusted relative risk for pregnancy outcomes following transfer of slow frozen and vitrified blastocysts, Australia and New Zealand, 2009–2011.

	Slow freezing	Vitrification ARR (95% CI)
Thawed cycles result in transfer[a]	Ref	1.05 (1.03, 1.08)*
Pregnancy outcomes[b]		
Clinical pregnancies/thaw cycle[a]	Ref	1.43 (1.37, 1.50)*
Clinical pregnancies/embryo transfer	Ref	1.38 (1.32, 1.45)*
Live deliveries/thaw cycle[a]	Ref	1.47 (1.39, 1.55)*
Live deliveries/embryo transfer	Ref	1.41 (1.34, 1.49)*
Live deliveries/clinical pregnancy	Ref	1.02 (0.97, 1.08)
Miscarriage/clinical pregnancy	Ref	0.91 (0.82, 1.01)
Perinatal outcomes[b]		
Perinatal mortality	Ref	1.10 (0.64, 1.89)
Preterm delivery	Ref	0.97 (0.75, 1.25)
LBW births	Ref	1.08 (0.89, 1.31)
SGA births[c]	Ref	0.88 (0.70, 1.10)
LGA births[c]	Ref	0.89 (0.78, 1.02)

Compared with slow frozen blastocysts, vitrified blastocysts resulted in significantly higher clinical pregnancy and live delivery rates with similar perinatal outcomes.

Ovarian function and obstetrical outcome:

A window of endometrial vulnerability

COS and ART: wed by necessity

ART and obstetrical outcome: a little small, a little early

Fresh and frozen embryo transfers: the unexpected

COS and oocyte quality

COS and obstetrical outcome

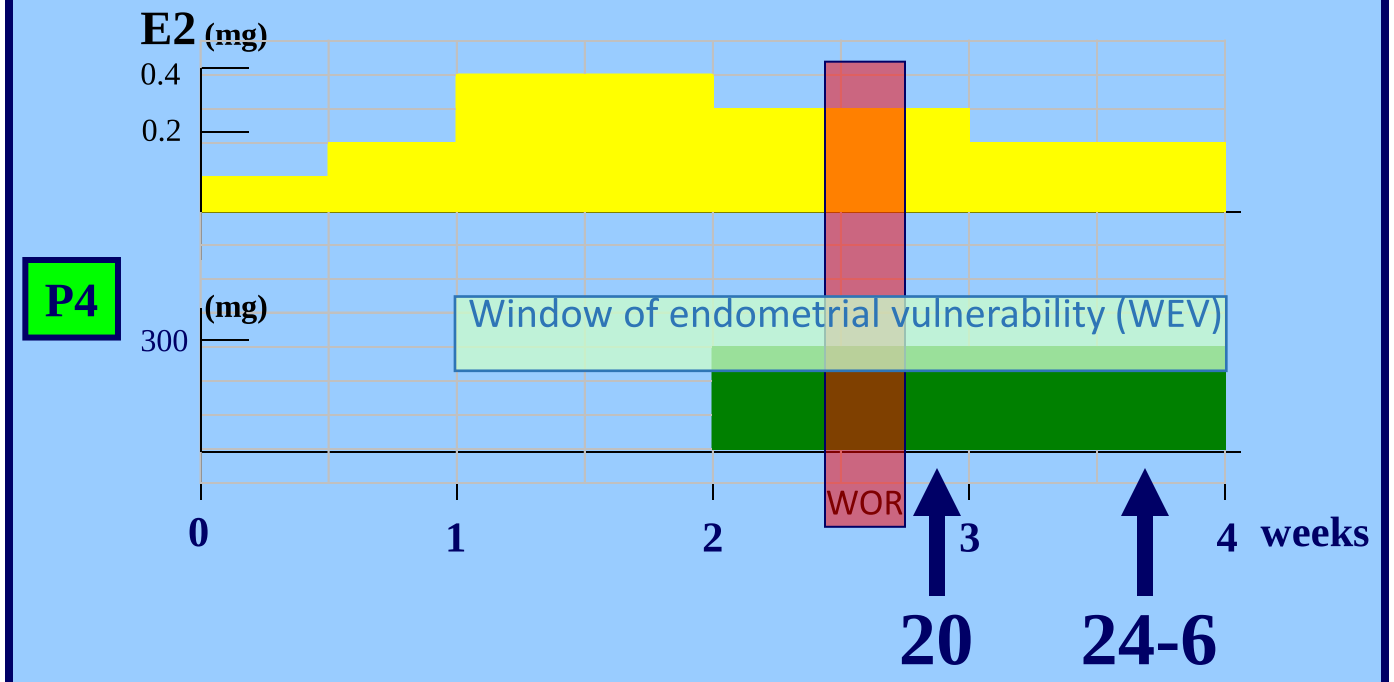
Window of receptivity and endometrial vulnerability

Ovarian function and obstetrical outcome:

A window of endometrial vulnerability

New concept:

Window of Endometrial Vulnerability (WEV)



Window of receptivity (WOR): controlled by duration of exposure to P4

Ovarian function and obstetrical outcome:

A window of endometrial vulnerability

Why we should transfer frozen instead of fresh embryos: the translational rationale

Rachel Weinerman, M.D. and Monica Mainigi, M.D.

Division of Reproductive Endocrinology and Infertility, University of Pennsylvania, Philadelphia, Pennsylvania

Epidemiologic studies have shown an increased rate of adverse perinatal outcomes, including small for gestational age (SGA) births, in fresh in vitro fertilization (IVF) cycles compared with frozen embryo transfer cycles. This increase is not seen in the donor oocyte population, suggesting that it is the peri-implantation environment created after superovulation that is responsible for these changes. During a fresh IVF cycle, multiple corpora lutea secrete high levels of hormones and other factors that can affect the endometrium and the implanting embryo. In this review, we discuss both animal and human data demonstrating that superovulation has significant effects on the endometrium and embryo. Additionally, potential mechanisms for the adverse effects of gonadotropin stimulation on implantation and placental development are proposed. We think that these data, along with the growing body of epidemiologic evidence, support the proposal that frozen embryo transfer should be considered preferentially, particularly in high responders, as a means to potentially decrease at least some of the adverse perinatal outcomes associated with IVF. Fertil Steril 2014;102:10–8. ©2014 by American Society for Reproductive Medicine.)

Key Words: In vitro fertilization, frozen embryo transfer, superovulation, implantation, placentation

Discuss: You can discuss this article with its authors and other ASRM members at http://fertstertforum.com/weinermanr-frozen-fresh-embryos-translational-rationale/

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Placentation

EFFECT OF SUPEROVULATION ON THE ENDOMETRIAL-EMBRYO INTERACTION

Effect on Embryonic Development and Fetal Growth

Gene expression profiles of simulated and nonstimulated human endometrium during the window of embryo implantation.

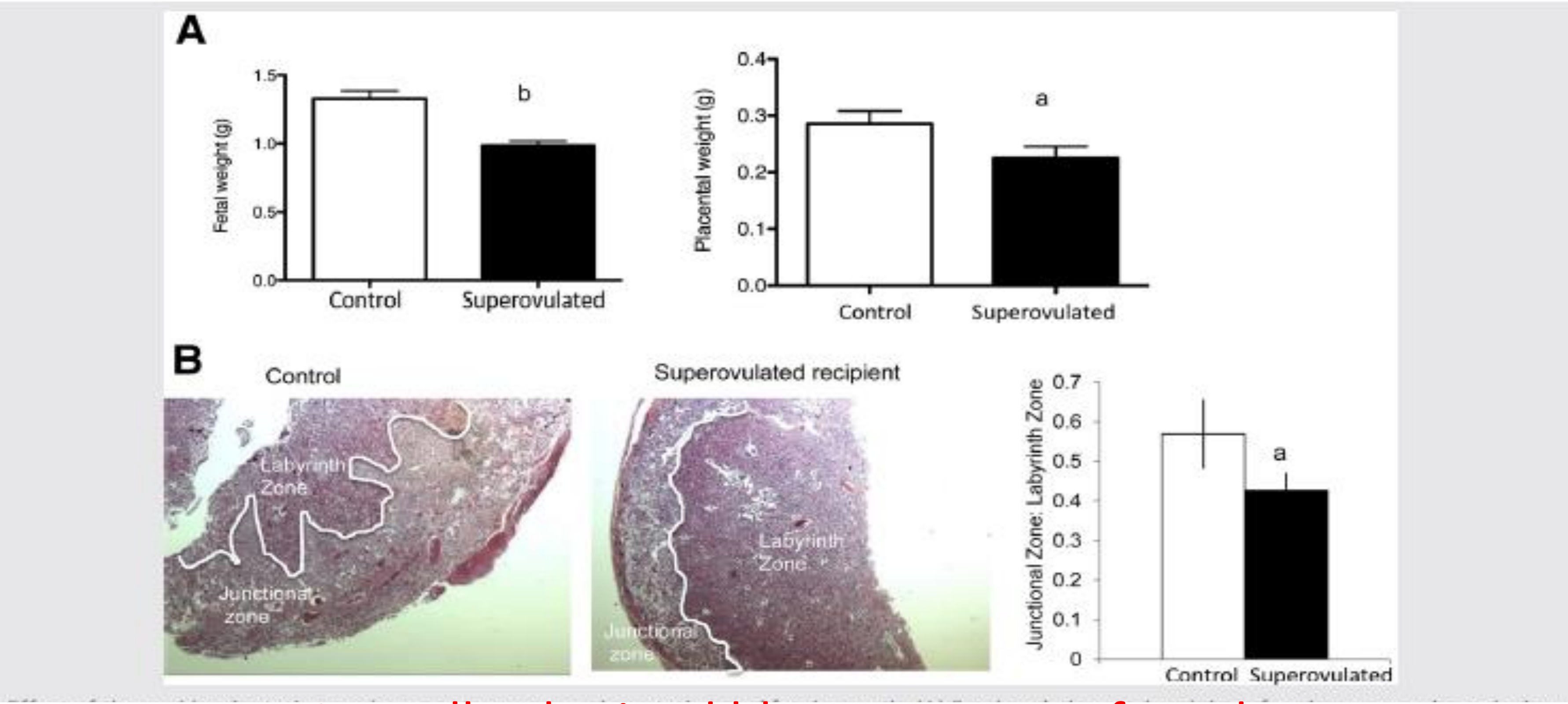
Study	No. of samples	Fold change considered to be significant	Number of genes Up	Down
Mirkin et al. (45)	13	≥1.2	5–6[a]	1–6[a]
Horcajadas et al. (46)	19	≥3	281	277
Simon et al. (47)	28	≥2	22–88[a]	24–100[a]
Horcajadas et al. (48)	49	–	69	73
Liu et al. (49)	13	≥2	5–244[a]	2–159[a]
Haouzi et al. (50)	84	≥2	321–657[a]	0–4[a]

[a] Ranges represent variation seen between different stimulation protocols.

Weinerman. Frozen vs. fresh ET: translational rationale. Fertil Steril 2014.

Ovarian function and obstetrical outcome:

A window of endometrial vulnerability



Naturally obtained blastocysts transferred
in control and super-ovulated mice

Women of Asian descent in Northern California have lower pregancy rates as compared to their caucasian counterparts, a difference that does not affect FET outcomes.

Reviews www.AJOG.org

REPRODUCTIVE ENDOCRINOLOGY AND INFERTILITY

Racial and ethnic disparities in reproductive endocrinology and infertility

Heather G. Huddleston, MD; Marcelle I. Cedars, MD; Sae H. Sohn, MD; Linda C. Giudice, MD, PhD; Victor Y. Fujimoto, MD

American Journal of Obstetrics and Gyn...

Asian ethnicity is associated with reduced pregnancy outcomes after assisted reproductive technology

Karen Purcell, M.D., Ph.D.,[a,b] Michael Schembri, M.S.,[b] Linda M. Frazier, M.D.,[c] Martha J. Rall, M.S.,[c,d] Shehua Shen, M.D.,[b] Mary Croughan, Ph.D.,[b] David A. Grainger, M.D.,[c,d] and Victor Y. Fujimoto, M.D.[b]

Fertil Steril 2007;87:297-302

Ethnic Differences in Assisted Reproductive Technologies Outcomes

Semin Reprod Med 2013;31:360–364

Trimble Spitzer, MD[1] Victor Y. Fujimoto, MD[2]

Year-one activity at FCC

Thirty-five years later, the first assisted reproductive technology program opens in Cambodia

In the fall of 2014, the first assisted reproductive technology (ART) program opened in Cambodia. This event took place in Phnom Penh 35 years after Cambodia emerged—in the early days of 1979—from the worst geopolitical nightmare and genocide that the world has known since the Holocaust. In nearly 4 years of abuse, the Khmer Rouge regi
active killing and starvation had exterminated a
country's population, who perished in the Killir
January 1979—the nightmare suddenly over—t
stood in rags and tears, with all needing to be r
scratch while wounds healed. Nearly concor
1978, the birth of the first baby conceived in
the way for the hallmark of today's infertility
worldwide, assisted reproductive technology, or A

Fertility Sterility 2015

Dominique de Ziegler, M.D.[a,b,c]
Sokteang Sean, M.D.[b]
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http://dx.doi.org/10.1016/j.fertnstert.2015.01.036

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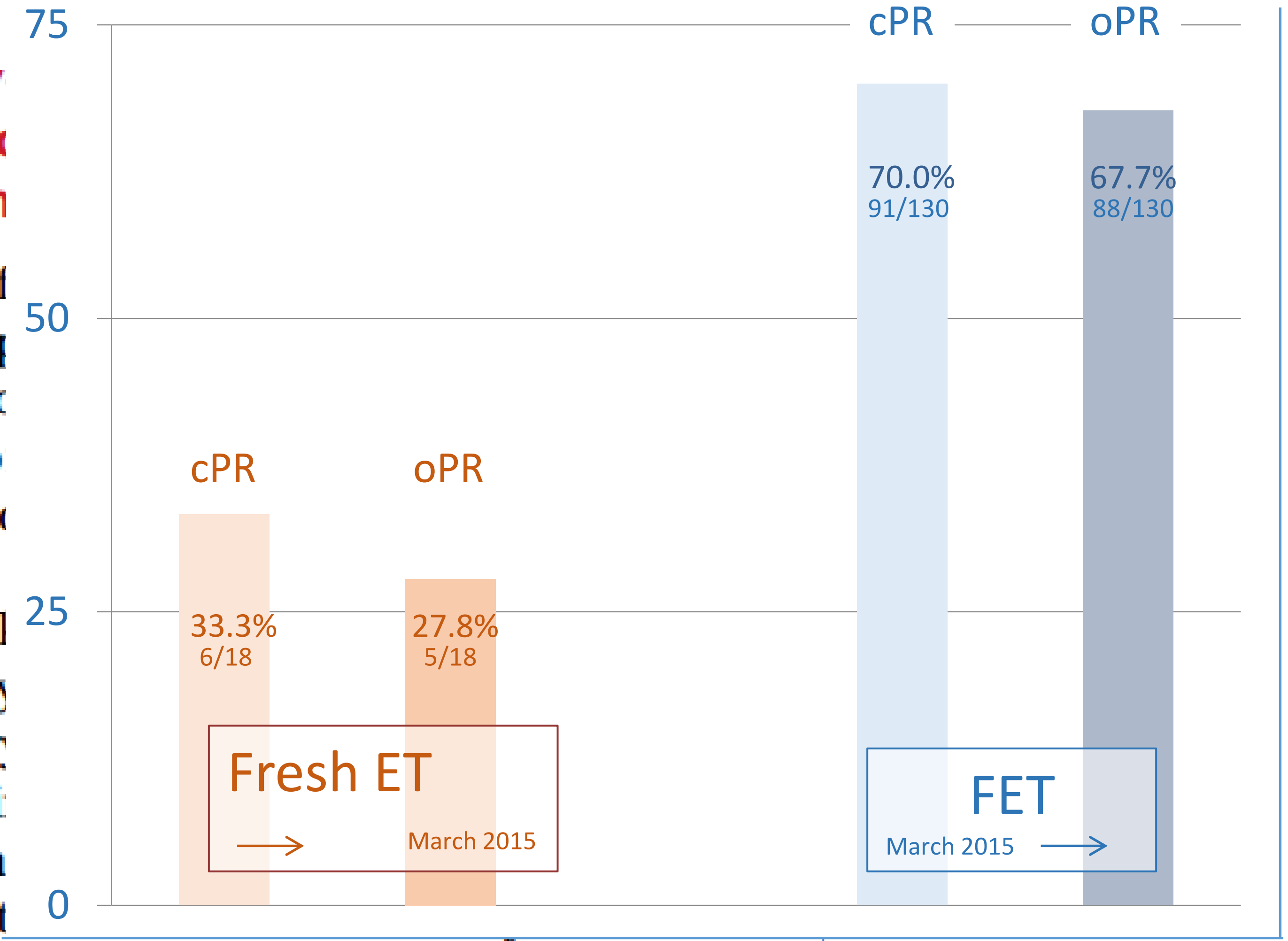
Year-one activity at FCC



ESHRE Helsinki 2016

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Ovarian function and obstetrical outcome:

A window of endometrial vulnerability

Ethnic variation in estradiol metabolism in reproductive age Asian and white women treated with transdermal estradiol

Heather G. Huddleston, M.D.,[a] *Mitchell P. Rosen, M.D.,*[a] *Mark Gibson, M.D.,*[b] *Marcelle I. Cedars, M.D.,*[a] *and Victor Y. Fujimoto, M.D.*[a]

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Asian women have significantly higher serum E_2 levels during treatment with transdermal E_2 compared with white women. This finding suggests altered metabolic clearance of this steroid hormone. (Fertil Steril® 2011;96:797–9.

Ovarian function and obstetrical outcome:
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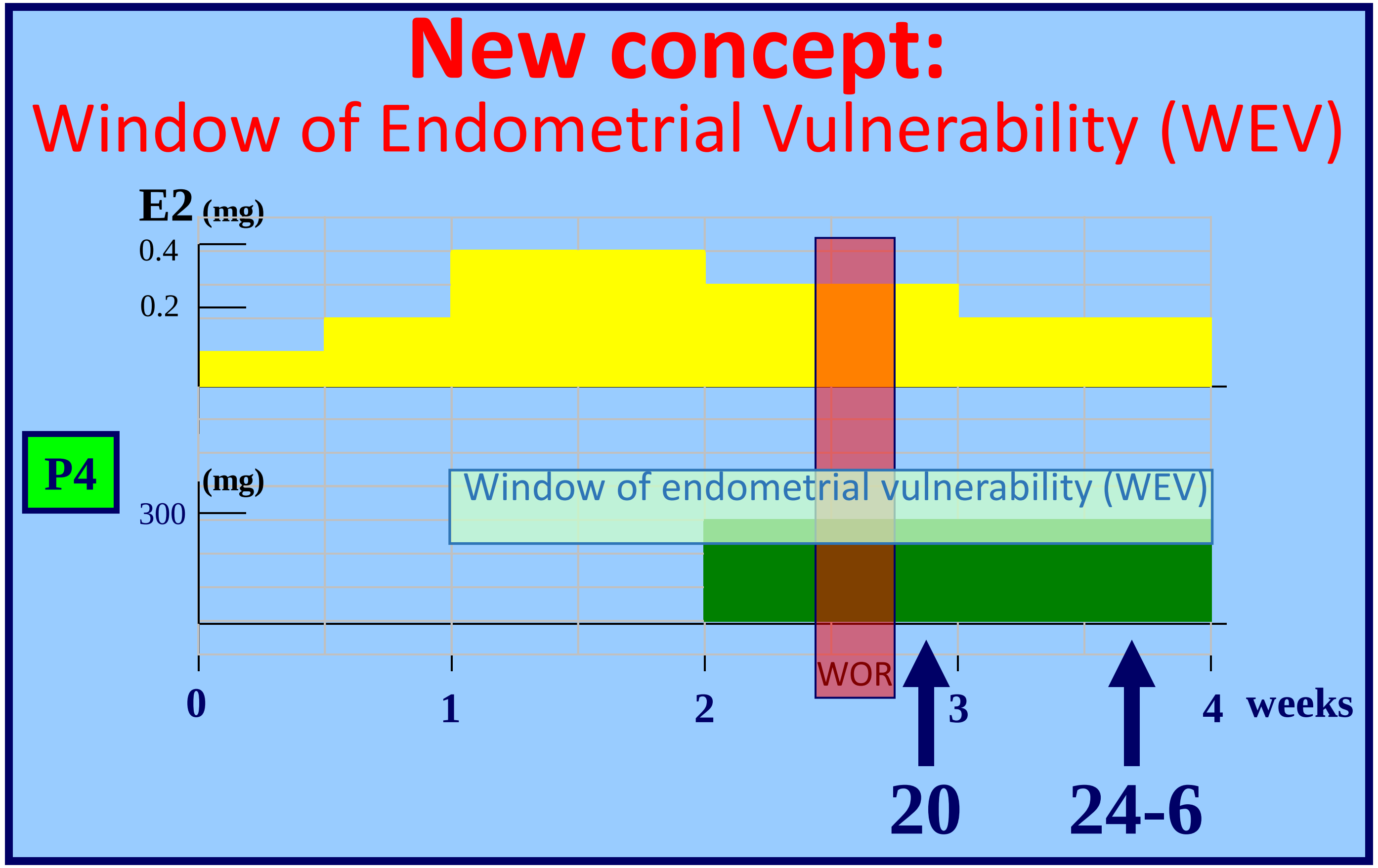

Window of receptivity (WOR): controlled by duration of exposure to P4

Ovarian function and obstetrical outcome:
A window of endometrial vulnerability

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